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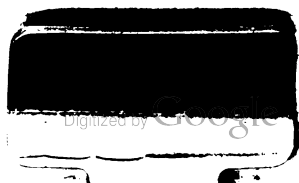
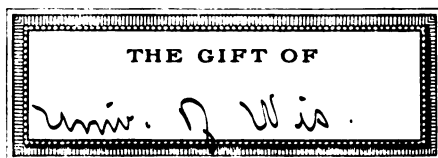
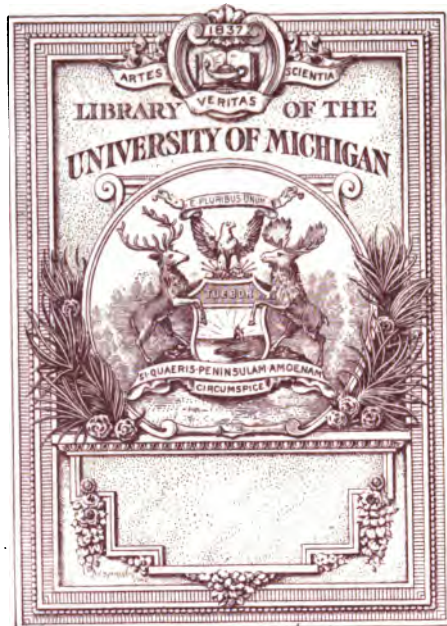
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TRANSACTIONS  
OF THE  
WISCONSIN  
State Horticultural Society,

INCLUDING  
ADDRESSES AND PAPERS PRESENTED, AND PROCEEDINGS  
AT THE SUMMER AND WINTER MEETINGS,  
FOR THE YEAR 1884-5.

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VOL. XV.

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WILLIAM TRELEASE, SECRETARY.



MADISON, WIS.:  
DEMOCRAT PRINTING CO., STATE PRINTERS.  
1885.





10.11.11, 3-17-11

SIR: In compliance with law, I have the honor to transmit to you the fifteenth volume of the transactions of the State Horticultural Society, including a full statement of the receipts and expenditures of the Society, together with a portion of the papers read at its meetings in 1884, and such other matter as has been deemed likely to promote the horticultural interests of the state.

WM. TRELEASE,

*Secretary.*

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## OFFICERS FOR 1885.

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### PRESIDENT.

J. M. SMITH, - - - - - GREEN BAY.

### VICE-PRESIDENT.

B. F. ADAMS, - - - - - MADISON.

### RECORDING SECRETARY.

WM. TRELEASE, - - - - - MADISON.

### CORRESPONDING SECRETARY.

B. S. HOXIE, - - - - - EVANSVILLE.

### TREASURER.

M. ANDERSON, - - - - - PINE BLUFF

### SUPERINTENDENT.

B. F. ADAMS, - - - - - MADISON.

# COMMITTEES.

## EXECUTIVE COMMITTEE.

### *Ex-Officio.*

THE ABOVE OFFICERS.

### *By Election.*

#### *Dist.*

1. S. HUNT, Evansville.
2. G. C. HILL, Rosendale.
3. B. F. ADAMS, Madison.
4. J. S. STICKNEY, Wauwatosa.

#### *Dist.*

5. W. REYNOLDS, Green Bay.
6. Mrs. D. HUNTLEY, Appleton.
7. A. G. TUTTLE, Baraboo.
8. E. G. PARTRIDGE, Warren.
9. WM. SPRINGER, Fremont.

## COMMITTEE ON NOMENCLATURE AND NEW FRUITS.

J. C. PLUMB, Milton.

A. L. HATCH, Ithaca.

GEO. P. PEFFER, Pewaukee.

## COMMITTEE OF OBSERVATION.

#### *Dist.*

1. GEO. J. KELLOGG, Janesville.
2. GEO. C. HILL, Rosendale.
3. B. F. ADAMS, Madison.
4. J. S. STICKNEY, Wauwatosa.

#### *Dist.*

5. H. FLOYD, Berlin.
6. D. HUNTLEY, Appleton.
7. WM. TOOLE, N. Freedom.
8. E. G. PARTRIDGE, Warren.
9. WM. SPRINGER, Fremont.

## FINANCE COMMITTEE.

H. C. ADAMS, Madison.

N. N. PALMER, Brodhead.

B. S. HOXIE, Evansville.

## MEMBERS, 1885.

Adam, John, Markesan.	Huntley, D., Appleton.
Adams, B. F., Madison.	Huntley, Mrs. D., Appleton.
Adams, H. C., Madison.	Innis, W. T., West Rosendale.
Alcott, Wm., Brodhead.	Jeffery, Geo., 630 Chestnut St., Milwaukeee.
Aldin, Isaac C., Weyauwega.	Jewett, Z. K., Sparta.
Anderson, Matt., Pine Bluff.	Keeney, Miss, Weyauwega.
Anderson, Andrew, Ne-nah.	Kellogg, Geo. J., Janesville.
Arnold, A. A., Galesville.	Kellogg, Emily L., Janesville.
Balch, A. V., Weyauwega.	Kindsman, C., Fremont.
Balsley, A. W., Weyauwega.	King, Edmund, Whitewater.
Barnes, A. D., Campbellsport.	Lawrence, F. S., Janesville.
Barter, Sam'l, Markesan.	Le Roy, J. H., De Pere.
Baxter, John, Weyauwega.	Libby, F. D., Madison.
Baumach, Wm. von, Wauwatosa.	Loudon, F. W., Janesville.
Bennett, A. S., Weyauwega.	Lowe, Victor, Palmyra.
Brown, J. M., Fremont.	Mahon, John, Preble.
Callender, Robert, Fremont.	McDonald, D., Verona.
Campbell, Henry, Evansville.	Mack, John, Weyauwega.
Campbell, Mrs. V. H., Evansville.	Marsh, H. F., Sun Prairie.
Chaplin, F. H., Rutland.	Masters, Wm., Weyauwega.
Churchil, Chas., Waupaca.	Mathews, James, Weyauwega.
Coe and Converse, Ft. Atkinson.	MaWhinney, Jas., Lind.
Cole, W. H., Brodhead.	Millis, Simeon, Madison.
Cotta, J. V., Lannark, Ill.	Morrison, W. H., Madison.
Crane, Wilder, Weyauwega.	Newton, Miss M. E., De Pere.
Daniels, E. W., Auroraville.	Noehle, Theodore, Green Bay.
Daugherty, Wm. F., Preble.	Olds, B. B., Clinton.
Dibble, G. W., Evansville.	Palmer, N. N., Brodhead.
Dickerson, H. J., Appleton.	Pammel, L. H., La Crosse.
Dore, J. S., Neillsville.	Parker, Col. —, Lind.
Eaton, C. F., Fremont.	Partridge, E. G., Warren.
Emerson, M. E., Door Creek.	Peffer, Geo. P., Pewaukee.
Fenelon, C. M., Weyauwega.	Peffer, Miss Kate, Pewaukee.
Field, S. F., East Troy.	Philips, A. J., Blunt, Dak.
Floyd, H., Berlin.	Phoenix, F. K., Delavan.
Frederick, S. I., Ithaca.	Phoenix, Frank, Delavan.
Gibson, H., Lind.	Pilgrim, D. T., West Granville (Express office, Milwaukeee).
Gill, Wm., Dayton.	Plumb, J. C., Milton.
Goss, B. F., Pewaukee.	Potter, C. W., Mauston.
Graves, S. W., Brooklyn.	Potter, Mrs. M. E., Weyauwega.
Greenman, C. H., Dodge Center, Minn.	Radley, Mrs. A., Lind.
Hacker, T. L., Madison.	Reid, Wm., North Prairie.
Haight, Nicholas, Syene.	Reid, Wm., Jr., North Prairie.
Hamilton, C. H., Ripon.	Reynolds, Werden, Green Bay.
Hanchett, Mark, Footeville.	Rich, O. A., Weyauwega.
Hatch, A. L., Ithaca.	Roe, Jas., Oshkosh.
Hill, Geo. C., Rosendale.	Scheisser, Paul, Fremont.
Hirschinger, Chas., Baraboo.	Scribner, Joseph, Rosendale.
Holmes, G. W., Fremont.	Seymour, A. N., Mazomanie.
Holt, M. A., Madison.	Smith, Albert, Weyauwega.
Howie, John, Waunakee.	Smith, Alfred, Madison.
Hoxie, B. S., Evansville.	Smith, J. M., Green Bay.
Hubbard, R. M., Weyauwega.	Spencer, R. C., Milwaukeee.
Hubbard, Mrs. R. M., Weyauwega.	
Hunt, Samuel, Evansville.	

b—H.



Spindler, Henry, Fremont	Vaughan, J. C., Chicago, Ill., 42 La
Springer, Wm., Fremont.	Salle Street.
Springer, John, Clinton.	Wakefield, J., Fremont.
Steiger, Jacob, Fremont.	Warren, A. A., Green Bay.
Stickney, J. S., Wauwatosa.	Wilson, R. D., Platteville.
Stone, I. N., Fort Atkinson.	West, J. R., Evansville.
Suydam, J. V., Green Bay.	Wilcox, E., Trempealeau.
Tarrant, Henry, Janesville.	Williams, Daniel, Summit.
Thompson, H. M., St. Francis.	Wilson, William, Weyauwega.
Toole, Wm., North Freedom.	Witt, Luther, Plymouth.
Trelease, Wm., St. Louis, Mo.	Wood, J. W., Baraboo.
Tuttle, A. G., Baraboo.	Woods, William, Weyauwega.
Wrightman, E. W., Weyauwega.	

## HONORARY MEMBERS.

## LIFE.

Dr. Joseph Hobbins, F. C. S., Cor- responding Member Royal Hort. Soc., etc., ex-President, Madison.	F. W. Case, ex-Recording Secretary, Madison.
O. S. Willey, ex-Recording Secretary.	Peter M. Gideon Excelsior, Minn.

## ANNUAL.

Mrs. A. A. Arnold, Galesville.	C. A. Hatch, Ithaca.
Mrs. Anna Brimmer, Richland Cen- ter.	Mrs. Alexander Kerr, Madison.
Mrs. Isaac Clark, Galesville.	C. E. Morgan, Madison.
J. S. Harris, La Crescent, Minn.	Rev. T. G. Owen, Trempealeau.
Mrs. Ida E. Tilson, West Salem.	
C. G. Patten, Charles City, Iowa.	

## FRUIT LIST.

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### APPLES.\*

*Seven varieties best adapted to Wisconsin—Hardiness, Productiveness and Quality taken into consideration—Duchess, Wealthy, Pewaukee, Fameuse, Plumb's Cider, Tallman Sweet, Wolf River.*

*Additional list for special locations—Tetofski, Red Astrachan, St. Lawrence, Fall Orange, Fall Spitzenberg, Alexander, Utter, Westfield Seek-No-Further, Willow Twig, Golden Russet, Walbridge, Orange Winter, McMahan's White.*

*For trial on sandy soil—Duchess, Fall Spitzenberg.*

### CRAB APPLES.

*For general cultivation—Whitney's No. 20, Gibb, Hyslop, Sweet Russet, Transcendent.*

### STRAWBERRIES.

*For general cultivation—Wilson, Crescent, Downing, Windsor Chief (Pistillate), with Longfellow and Mt. Vernon as late fertilizers of the Crescent.*

*For trial—Kentucky, Cumberland, Bidwell, Vick, Piper, Manchester (Pistillate).*

*Special list for light soils—Crescent, Wilson, Downer, Manchester (Pistillate).*

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\* NOTE.—The question of adaptation of varieties is one so largely dependent upon local conditions of soil, elevation and aspect, that a general list will not answer fully the wants of every planter, and at best can only be a general guide in the selection of varieties.

For more specific directions, the following rules and lists are furnished by the committee chosen for this purpose:

1. Locations comparatively elevated and well drained, with a cool northern aspect and fine gravelly clay soil, not very rich, may extend the general list named above to an indefinite extent, with fair prospect of success in southern and eastern districts of the state. But for warm, sheltered locations and rich soils, which induce a great growth, no section of our state can safely plant other than those varieties known to be extremely hardy.

2. The best guide in the selection of varieties is for each to plant largely of such varieties as are found successful in locations similar to that each must plant upon. For all unfavorable locations, and extreme northern districts, only the most hardy, well tried apples of the Russian or Siberian types should be chosen for general planting.

3. In the extreme northern districts, only the crown of the hills should be chosen for the orchard, with a firm soil and porous subsoil, and if these materials are wanting naturally, they should be supplied artificially.

For opinions on the varieties recommended, see transactions of the winter meeting.

### GRAPES.

*For general cultivation.*—Worden, Concord, Delaware, Brighton, Moore's Early.

*For frosty and otherwise unfavorable locations.*—Janesville, Champion.

*For trial in favorable locations.*—Israella, Elvira, Duchesse, Pocklington, Prentiss, Jefferson, Lady, Lady Washington.

### THIMBLEBERRIES.

(Black Raspberries.)

*For general cultivation.*—Gregg, Miami, Doolittle.

*For trial.*—Ohio, Souhegan, Tyler.

### RED RASPBERRIES.

*For general cultivation.*—Cuthbert, Turner, Brandywine.

*For trial.*—Shaffer's Colossal.

### BLACKBERRIES.

*For general cultivation.*—Snyder, Stone's Hardy, Ancient Briton. (Winter protection is recommended for all).

*For trial.*—Taylor, Bartel's Dewberry.

### PEARS.

*Most likely to succeed.*—Flemish Beauty.

*For trial in favorable localities.*—Ananas d'Été, Early Bergamot, Bartlett, Onondaga, (*Swan's Orange*), Seckel, Winter Nélis, Clapp's Favorite, Beurré d'Anjou, Doyenné d'Été.

### PLUMS.

*For general cultivation.*—De Soto.

*For special localities.*—Lombard, Imperial Gage, Yellow Gage, (*Magnum Bonum*), Eldridge, Duane's Purple.

*For trial.*—Cheney (on recommendation of J. S. Harris).

### CHERRIES.

*For general cultivation.*—Kentish (*Early Richmond*), Late Kentish, Morello.

# TREE AND SHRUB LIST.

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## EVERGREENS.

*For general culture*—Norway Spruce (*Abies excelsa*), White Pine (*Pinus strobus*), Arbor Vitæ (*Thuja occidentalis*), Scotch Pine (*Pinus sylvestris*), Balsam Fir (*Abies balsamea*), White Spruce (*Abies alba*).

*For ornamental planting*—Austrian Pine (*Pinus austriaca*), Red or Norway Pine (*Pinus resinosa*), Hemlock (*Abies canadensis*), Siberian Arbor Vitæ (*Thuja orientalis*), Red Cedar (*Juniperus virginiana*), Dwarf Pine (*Pinus montana*).

*For timber*—White Pine (*Pinus strobus*).

*For live fence posts*—Norway Spruce (*Abies excelsa*).

## DECIDUOUS PLANTS.

*For timber*—White Ash (*Fraxinus americana*), European Larch (*Larix europaea*).

*Nut-bearing trees*—Hickory (*Carya alba* and *C. sulcata*), Black Walnut (*Juglans nigra*), Butternut (*Juglans cinerea*).

*Street shade trees*—White Elm (*Ulmus americana*), Hard Maple (*Acer saccharinum*), Basswood or Linden (*Tilia americana*), Hackberry (*Celtis occidentalis*).

*Trees for lawn* (in order named)—Weeping Cut-leaved Birch (*Betula alba*, var.), Linden (*Tilia americana*), Hackberry (*Celtis occidentalis*), Green Ash (*Fraxinus viridis*), European Mountain Ash (*Pyrus aucuparia*), Oak-leaved Mountain Ash (*Pyrus aucuparia*, var.), European Larch (*Larix europaea*), American Mountain Ash (*Pyrus americana*), Horse Chestnut (*Aesculus hippocastanum*), Wisconsin Weeping Willow (*Salix* ———), New American Weeping Willow (*Salix* ———), Weeping Golden-barked Ash (—————), Weeping Mountain Ash (*Pyrus aucuparia*, var.), Weeping Poplar (*Populus tremula*, var.).

*Shrubs for lawn* (in order named)—Snowball (*Viburnum opulus*), *Hydrangea grandiflora*, Syringa (*Philadelphus coronaria*), *Deutzia*, Weigelia (*Diervilla rosea*), Upright Honeysuckles (*Lonicera tatarica* etc.), Flowering Quince (*Pyrus japonica*), Flowering Almond (*Amygdalus nanus*), Spiraeas, Strawberry Bush (*Euonymus americanus*), Fringe or Smoke Tree (*Rhus cotinus*), Purple-leaved Barberry (*Berberis vulgaris*, var.), Lilac, White and Purple (*Syringa vulgaris*), Persian Lilac (*Syringa persica*), Black Alder (*Ilex verticillata*).

*Climbers*— American Ivy (*Ampelopsis quinquefolia*), Scarlet Honeysuckle (*Lonicera sempervirens*), Fragrant Honeysuckle (*Lonicera caprifolium*), *Clematis jackmanni*, Virgin's Bower (*Clematis virginiana*).

ROSES (with protection).

*Climbers*— Queen of the Prairie, Gem of the Prairie, Baltimore Belle.

*Moss roses*— Princess Adelaide, Luxembourg and others.

*Hybrid and June roses*— Persian, Yellow Harrison, Madame Plantier, General Jacqueminot, La France, General Washington.

ACT OF REORGANIZATION  
OF THE  
STATE HORTICULTURAL SOCIETY.

---

CHAPTER 151, LAWS OF 1879.

SECTION 1. The executive committee of the Wisconsin State Horticultural Society shall hereafter consist of the president, secretary and treasurer of said society, and of one member from each congressional district of the state, said members from the congressional districts to be chosen annually by the county and local horticultural societies in the respective districts.

SECTION 2. The present officers and executive committee of said society shall hold their respective offices until the Tuesday next succeeding the first Monday in February, 1880, and until their successors are appointed.

SECTION 3. It shall be the duty of the said society to aid in the formation and maintenance of county and local horticultural societies, to promote the horticultural interests of the state by the holding of meetings for discussion; by the collection and dissemination of valuable information in regard to the cultivation of fruits, flowers and trees adapted to our soil and climate, and in every proper way to advance the fruit and tree growing interests of the state.

SECTION 4. The annual meeting of the society shall be held on the Tuesday next succeeding the first Monday in February of each year, for the election of its officers, the transaction of general business, and the consideration of questions pertaining to horticulture.

SECTION 5. All vacancies in the offices of said society may be filled by the executive committee; and should there be a failure to elect a member of the executive committee in any district, the vacancy may be filled by a two-thirds vote of the members of the society present at any regularly appointed meeting.

SECTION 6. It shall be the duty of the secretary of said society to make an annual report to the governor of the state of the transactions of the society, including an itemized account of all moneys expended during the year, in addition to such matters as are now specified in the law relating to the same.

SECTION 7. The number of printed pages of said report shall not exceed three hundred and fifty, and the number of copies shall be limited to three thousand five hundred. In all other respects the publication and distribution of said report shall be in accordance with the provisions of law now in force concerning the same.

SECTION 8. The sum of \$600 is hereby appropriated out of any money in the state treasury not otherwise appropriated, to aid the said society in carrying out the provisions of this act; said sum to be paid by the state treasurer upon the order of the president of said society, in such sums and at such times as shall best contribute to the prosperity of the society and the interests it represents.

SECTION 9. This act shall take effect and be in force from and after its passage and publication.

Approved March 1, 1879.

# CONSTITUTION AND BY-LAWS.

*As amended February, 1885.*

---

## CONSTITUTION.

ARTICLE I. This society shall be known as the Wisconsin State Horticultural Society.

ARTICLE II. Its object shall be the advancement of the art and science of horticulture throughout the state.

ARTICLE III. Its members shall consist of *annual* members, paying an annual fee of one dollar, which shall entitle the wife of such member to the privileges of full membership, of secretaries of local horticultural societies reporting to the state society, who shall be considered members *ex-officio*; of *life* members, paying a fee of ten dollars at one time; of *honorary life* members, who shall be distinguished for merit in horticultural and kindred sciences, or who shall confer any particular benefit upon the society; and *honorary annual* members, who may, by vote, be invited to participate in the proceedings of the society.

ARTICLE IV. Its officers shall consist of a President, Vice-President, Recording Secretary, Corresponding Secretary, Treasurer, Superintendent, and an Executive Board, consisting of the foregoing officers and additional members, one from each congressional district of the state, five of whom shall constitute a quorum at any of its meetings. In addition to the foregoing officers, the presidents of all local horticultural societies reporting to this society shall be deemed honorary members and *ex-officio* vice-presidents of this society. All officers shall be elected by ballot, and shall hold their office for one year thereafter, and until their successors are elected; provided, the additional executive members may be elected by the county or local horticultural societies of their respective districts.

ARTICLE V. The society shall hold its annual meeting for the election of officers, commencing on the first Monday in February. It may also hold a meeting in December of each year, at such place and time as may be decided upon by the society, or its executive committee, for the exhibition of fruit and for discussions, and such other meetings for discussions and exhibitions, as the executive committee may direct, at such time and place as the executive board shall designate.

ARTICLE VI. This constitution, with the accompanying by-laws, may be amended at any regular meeting, by a two thirds vote of the members present.



BY-LAWS.

I. The president shall preside at meetings, and, with the advice of the recording secretary, call all meetings of the society and have general supervision of the affairs of the society; and shall deliver an annual address upon some subject connected with horticulture.

II. The vice-president shall act in the absence or disability of the president, and perform the duties of the chief officer.

III. The secretary shall attend to all the correspondence, shall record the proceedings of the society, preserve all papers belonging to the same and superintend the publication of its reports. He shall also present a detailed report of the affairs of the society, at its annual meeting. He shall also endeavor to secure reports from the various committees, and from local societies, of the condition and progress of horticulture in the various districts of the state and report the same to the society. It shall be the duty of the secretary to make an annual report to the governor of the state, of the transactions of the society, according to the provisions of the statutes for state reports.

IV. The treasurer shall keep an account of all moneys belonging to the society, and disburse the same on the written order of the president, countersigned by the secretary, and shall make an annual report of the receipts and disbursements, and furnish the secretary with a copy of the same, on or before the first day of the annual meeting. The treasurer elect shall, before entering upon the discharge of the duties of his office, give good and sufficient bonds for the faithful performance of his duties, subject to the approval of the executive committee.

V. The executive board may, subject to the approval of the society, manage all its affairs and fill vacancies in the board of officers; three of their number, as designated by the president, shall constitute a finance committee.

VI. It shall be the duty of the finance committee to settle with the treasurer, and to examine and report upon all the bills or claims against the society which may have been presented and referred to them.

VII. The standing committees of this society shall be as follows: 1st, Committee on Finance, consisting of three members; 2d, Committee on Nomenclature and New Fruits, consisting of three members; 3d, Committee on Observation, as now provided. Said committees to be appointed annually by the executive committee of the society.

## LAWS RELATING TO THE SOCIETY.

*Chapter 151, Laws of 1879.*

SECTION 6. It shall be the duty of the secretary of said society to make an annual report to the governor of the state of the transactions of the society, including an itemized account of the moneys expended during the year, in addition to such matters as are now specified in the law relating to the same.

SECTION 7. The number of printed pages of said report shall not exceed three hundred and fifty, and the number of copies shall be limited to three thousand five hundred. In all other respects, the publication and distribution of said report shall be in accordance with the provisions of the law now in force concerning the same.—[*Revised Statutes, 1878.*]

*Chapter 320, Laws of 1883.*

SECTION 7. There shall be printed annually by the state printer, and on the order of the commissioners of public printing, the following documents. \* \* \* \* \*

2. Twelve thousand copies of the transactions of the Wisconsin State Horticultural Society, together with such abstracts of reports of county and other horticultural societies, and such other matters pertaining to fruit growing and other horticultural interests of the state as shall be deemed important; provided, the number of pages shall not exceed two hundred. \* \* \* \* \*

SECTION 8. Eleven thousand five hundred volumes of said report shall be bound in cloth, uniform in style with volumes previously published, each volume to contain one copy of each of the reports designated in the preceding section, and shall be distributed as follows: Thirty copies to each member of the legislature; one hundred copies to the State Historical Society; twenty-five copies to each county agricultural society and district industrial association which embraces two or more counties and furnishes the State Agricultural Society a report of its proceedings; one hundred copies to the State Horticultural Society; twenty-five copies to each county horticultural society that shall report its organization, with officers elect, and give an abstract of its proceedings for publication in said volume to the secretary of the State Horticultural Society; one hundred copies to the State Dairymen's Association; fifty copies to the State University; five copies to the Wisconsin Humane Society; two copies to each public library in the state; and the remaining copies to the State Agricultural Society for distribution by its secretary.

SECTION 9. Five hundred copies of the transactions of the State Agri-

cultural Society, and five hundred copies of the transactions of the State Horticultural Society, shall be bound singly, in cloth; five hundred copies of the transactions of the State Dairymen's Association, and five hundred copies of the report of the department of agriculture of the State University, shall be bound in paper, for the use of these several societies and departments for distribution or exchange.

## CHAPTER 435, LAWS OF 1885.

SECTION 7. 2. Sixteen thousand five hundred copies of the transactions of the Wisconsin State Horticultural Society, together with such abstracts of reports of county and other horticultural societies, and such other matters pertaining to fruit growing and other horticultural interests of the state as shall be deemed important; *provided*, the number of pages shall not exceed three hundred. \* \* \* \* \*

SECTION 8. Thirteen thousand volumes of said report shall be bound in cloth, uniform in style with volumes previously published, each volume to contain such part of one copy of each of the reports designated in the preceding section, as the compiler shall select, the size of said joint report not to exceed one thousand pages; and shall be distributed as follows: Thirty copies to each member of the legislature; one hundred copies to the State Historical Society; twenty-five copies to each county agricultural society and district industrial association which embraces two or more counties, and furnishes the State Agricultural Society a report of its proceedings; one hundred copies to the State Horticultural Society; thirty copies to each county horticultural society; two hundred copies to the State Dairymen's Association; one hundred copies to the experiment station of the state university, twenty-five copies to the library of the state university; five copies to the Wisconsin Humane Society. To the governor, lieutenant-governor, secretary of state, state treasurer, attorney general, state superintendent of public instruction, railroad and insurance commissioners twenty-five copies each; to each public library in the state two copies; and the remaining copies to the State Agricultural Society for distribution by its secretary.

SECTION 9. Twenty-five hundred copies of the transactions of the State Horticultural Society shall be bound singly in cloth and one thousand in paper. Twenty-five hundred copies of the State Dairymen's Association shall be bound in cloth and twenty-five hundred in paper. Twenty-five hundred copies of the report of the Agricultural Experiment Station of the state university shall be bound in cloth and twenty-five hundred in paper for the use of these several societies and departments for distribution or exchange.

## CHAPTER 36, LAWS OF 1885.

To appropriate to the Wisconsin State Horticultural Society a sum of money.

SECTION 1. There is hereby appropriated to the Wisconsin State Horticultural Society the sum of two thousand dollars, out of any money in the state treasury not otherwise appropriated. This appropriation is made to cover the years of 1885 and 1886, and shall be paid to said society in two annual equal payments, viz.: in 1885 and 1886.

SECTION 2. This act shall take effect and be in force from and after its passage and publication.

Published April 10, 1885.

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LAW RELATING TO TREE BELTS.

*Revised Statutes, 1878.*

SECTION 1469. Every owner or possessor of five acres of land, or more, who shall successfully grow by planting with forest trees, consisting of the following kinds, or such species thereof as will grow to the height of fifty feet or more, viz.: arbor vitæ, ash, balsam fir, basswood, beech, birch, butternut, cedar, black cherry, chestnut, coffee tree, cucumber tree, elm, hackberry, hemlock, hickory, larch, locust, maple, oak, pine, spruce, tulip tree and walnut, tree belts in the manner and form prescribed in the next section, shall be entitled to have the land on which such tree belts grow exempted from taxation from the time the trees commence to grow until they shall reach the height of twelve feet, and after they have attained that height, to receive an annual bounty of two dollars per acre for each acre so grown.

SECTION 1470. Such tree belts shall be planted on the west or south sides of each tract of land, be of uniform width through their entire length, contain not less than eight trees, at nearly equi-distance, on each square rod of land, and be at least thirty feet wide for each five acre tract, sixty feet wide for each ten acre tract, and one hundred feet wide for each square forty acre tract, and upon all square tracts of land, upon two sides thereof. All tree belts owned by the same land owner must be planted not to exceed a fourth of a mile apart, and on the west and south sides of every square forty acres, and shall not exceed one-fifth of the entire tract of land on which the same are planted; provided, that when the east and north sides, or either, of any tract of land, is bounded by a public highway, a tree belt one rod wide may be planted next to said highway, although it, with the

others on the west and south sides, shall exceed one-fifth of the whole tract; and tree belts may be planted on any other lines within each forty square acres, by permission of the assessor.

SECTION 1471. The assessor shall, upon the application of the owner thereof, in each year, at the time of assessing the personal property in his district, make a personal examination of all tree belts for which bounty or exemption from taxation is claimed, and ascertain whether they have been planted as required in the preceding section, and are thriftily growing, and if he shall be satisfied thereof, he shall not assess the same for taxation unless the trees therein shall have attained the height of twelve feet, and in that case he shall deliver to the owner a certificate that he is entitled to an annual bounty of two dollars for each acre of such tree belts, stating therein the whole amount of such bounty and giving a description of the entire land of which the tree belts form a part, and the amount of such bounty shall be credited by the treasurer in payment of any taxes assessed on such land, as so much cash; but if not so satisfied, the assessor shall assess the land for taxes or refuse to grant any certificate for the bounty, as the case may require; and if, after any certificate for such bounty shall have been issued, the owner of any such tree belts shall suffer the same to die out by want of cultivation or otherwise, or shall cut the same down, or in any other way allow the same to be so thinned out, that in the opinion of the assessor he ought no longer to receive such bounty, he shall give the treasurer written notice thereof, and thereafter no further bounty shall be allowed until such owner shall again receive a certificate therefor.

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## TO REGULATE THE SALE OF CRANBERRIES.

### *Chapter 384, Laws of 1885.*

SECTION 1. The legal and standard cranberry barrel in this state shall be twenty-three and three quarters inches high, sixteen and one fourth inches in diameter at the head, and eighteen inches in diameter at the bilge, inside measure. Every manufacturer of barrels for cranberries shall stamp or brand his name with the letters, W. S. on such barrels to indicate that they are the Wisconsin Standard in size. All sales of cranberries in packages less than a barrel shall be by the bushel or quart, struck or level dry measure. A standard bushel crate for cranberries shall be twenty-two inches long, twelve and one fourth inches wide by seven and one half inches deep inside measure.

SECTION 2. Any person who shall in such manner stamp or brand cranberry barrels of a less capacity than is provided in the first section of

this act, shall be guilty of a misdemeanor and upon conviction sha'll be fined in a sum not less than five nor more than twenty-five dollars and costs of suit, and may be committed to jail until such fine and costs are paid. Any person selling cranberries in barrels not thus branded, of less capacity than herein provided shall be liable to the purchaser in damages to three times the amount of such shortage, and all contracts or agreements far the sale of cranberries by the barrel or crate, unless otherwise specially stipulated shall be understood and construed to mean legal standard barrels or crates.



TRANSACTIONS  
AT THE  
SUMMER MEETING  
HELD BY THE  
**Wisconsin State Horticultural Society,**

*At La Crosse, June 24-5, 1884.*

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The summer meeting of this society was held, according to announcement, at La Crosse, with the Northwestern Society, June 24th and 25th. The sessions and exhibition were in the court house, which, in the shady park in which it is located, proved a quiet and pleasant place for the purpose.

President J. S. Harris, of the Northwestern Society, introduced Judge B. F. Bryant, who welcomed the State Society to the beautiful city and its hospitalities. President J. M. Smith of the State Society who was then called to preside at the sessions, declined to make any set speech, but said that he hoped to be able to assist with suggestions growing out of his experience, as the work of the day advanced.

J. S. Harris, of La Crescent, Minn., read a paper on Progressive Horticulture, prefaced by some personal remarks of peculiar interest. This paper contained many excellent thoughts and suggestions.

Mrs. Vie H. Campbell presented a paper concerning women's work and how to make it easier. She stated as her proposition that a woman could not, like a man, have one trade or profession, but must have a dozen or so — cooking, washing, tailoring, etc. The paper in some degree was



a plea for domestic co-operation. She cited as illustrative, the Co-operative Home at Evansville, in this state, where twenty families have their meals at a central house, paying \$2.50 per week for adults; quarter, half and three quarter rates for children, and a shilling a meal for visitors. This paper was one of great practical interest.

Mrs. Ida E. Tilson read a bright, entertaining paper entitled "Nature's Suggestions," which was received with applause.

Mrs. Ida Clark, of Galesville, read a paper on "Flowers in the Home." The paper was a plea for the home, and for bringing into use every means within reach to make home the happiest place in the world for the children. Especially was the influence of the parents dwelt upon, and the tremendous responsibility resulting therefrom impressed upon the audience.

Mrs. H. M. Lewis gave a history of the Flower Mission, in such an interesting way that the project was broached of starting a branch of the mission in La Crosse.

A paper by Rev. T. G. Owens, of Trempealeau, on "Man's Relation to the Physical World," was then read, and followed by a practical statement of the work of the State Society, its sources of strength and weakness, and suggestions for the good of the society, by J. C. Plumb, of Milton.

Hon. A. A. Arnold, of Trempealeau, read a well prepared paper on youthful training, claiming that a business education was what the child wanted.

Each of these papers was followed by a free discussion, in which much practical common sense was shown.

The committee on resolutions introduced the following, which were adopted:

*Resolved*, That the thanks of the Wisconsin State Horticultural Society, and of the Northwestern Horticultural Society are hereby tendered to the officials of La Crosse county for their generosity in allowing the use of the Court House, and for the many other courtesies extended upon this occasion.

*Resolved*, That we tender our sincere thanks to the people of La Crosse and the members of the Northwestern Horticultural Society for their bountiful entertainment, their excursion around this beautiful city and on the river, and our kind reception at their homes.

*Resolved*, That we recognize the courtesy of the Chicago & Northwestern, and the Chicago, Milwaukee & St. Paul Railway companies in giving the usual reduction of fare to those passing over their roads to this meeting.

*Resolved*, That we invite more discussion at our convention, with a free use of the question box.

*Resolved*, That the writers of papers be requested not to exceed fifteen minutes in their presentation, and that speakers taking part in the discussions be restricted to five minutes unless granted special permission to speak longer.

*Resolved*, That the president of the Wisconsin Horticultural Society as such use his influence with the Commissioner in behalf of our society, for an appropriation of not less than one thousand dollars, for the use of said society at the New Orleans exhibit, and that said funds be used for the purpose of making said exhibit for the best interests of the state.

#### PREMIUMS AWARDED.

##### STRAWBERRIES.

Greatest and best collection, first, Geo. J. Kellogg; second, E. Wilcox; third, J. M. Smith.

Best new seedling, never before exhibited, first, N. Hintgen; second, J. C. Kramer.

Best quart of strawberries, first, Mrs. T. B. Benton.

Best quart Wilcox, first, J. S. Harris; second, E. Wilcox.

Chas. Downing, first, N. Hintgen; second, J. S. Harris.

Manchester, first, E. Wilcox; second, G. J. Kellogg.

Bidwell, first, E. Wilcox.

James Vick, first, G. J. Kellogg.

Crescent Seedling, first, J. S. Harris; second, A. G. Tuttle.

Big Bob, first, G. J. Kellogg.

Capt. Jack, first, J. C. Kramer.

Sharpless, first, N. Hintgen.

##### PLANTS AND FLOWERS.

Greatest and best collection of green house and hot house plants by professional, first, J. A. Salzer; second, Paul Bork; third, H. Kienahs.

Greatest and best collection of green — and hot house plants by amateur, first, Mrs. J. W. Weston; second, J. C. Kramer.

Geraniums in bloom, first, J. A. Salzer; second, H. Kienahs.

Roses in bloom, first, J. A. Salzer.

Fuchsias in bloom, first, J. A. Salzer; second, H. Kienahs.

Floral design, first, H. Kienahs; second, H. Kienahs.

Bouquet of roses, first, J. A. Salzer; second, Mrs. E. Wilcox.

Pansies, first, William Toole; second, J. A. Salzer.

Wild flowers named, first, Isabelle Van Loon; second, Henry Willsie.

The premium for best hand bouquet being unappropriated the committee recommended that it be paid to Mina Kramer, whose bouquet of wild flowers, though unnamed, deserved special mention for tasteful arrangement and large variety.

#### VEGETABLES.

Best collection, first, H. Gulliam; second, N. Hintgen; third, J. M. Smith.

Asparagus, first, J. C. Kramer; second, N. Hintgen.

Beets, carrots and peas, first, N. Hintgen; second, H. Gulliam.

Pieplant, first, N. Hintgen, second, J. S. Harris.

Onions, first, H. Gulliam, second, N. Hintgen.

Turnips, first, J. M. Smith; second, H. Gulliam.

Cabbage, first, N. Hintgen; second, J. M. Smith.

Cauliflower, first, H. Gulliam.

The exhibition of summer fruits, flowers, plants and vegetables was one of the best our state has ever had; J. A. Salzer, N. Hintgen and H. Gulliam, of La Crosse, J. S. Harris, of La Crescent, and J. M. Smith, of Green Bay, all showing vegetables which were remarkable for luxuriant growth and perfection. Eight-inch cabbage heads, beets and onions nearly full grown, fine heads of cauliflower, cucumbers, carrots, peas, lettuce and potatoes, made a showing that augurs well for a year of plenty in central Wisconsin.

The display of plants and flowers was to many the most attractive, and is worthy of special mention. Paul Bost, John A. Salzer and H. Kienah made each a large display of green-house plants, which vied with the vegetables in luxuriance. William Toole showed his beautiful pansies. Bouquets were entered by Mrs. Pepper, Mrs. Wilcox and Mrs. Campbell, while others, not entered for premiums, were on exhibition. Especially noteworthy were collections of wild flowers by Mina Kramer and Henry Willsie.

The strawberry show was not large, but of good quality considering the distance which most of the fruit came, and the extremely hot and rainy weather. The fruit of J. M. Smith, of Green Bay, was badly injured by detention on the way, and so with the stool of Loudon's No. 1, which had fifty perfect berries on it at the time of starting. Yet Mr. Smith showed an immense stool growth of Wilson, proving that with him it had not run out, but that in his

soil and under his high pressure treatment it was second to none in vigor or productiveness.

The meeting at La Crosse was marked by the same courtesies and hospitality that are uniformly experienced by the society in its conventions with local societies, and promises to prove of more than usual value in encouraging the believers in progressive horticulture in Wisconsin.

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### MEETING AT THE STATE FAIR.

MADISON, WIS., Sept. 17, 1884.

In response to a call issued by the president, the members of the Society present at the fair assembled in the office of the Board of Supervision, at the capitol, at 7:45 P. M.

The meeting was called to order at the appointed time, and, in the absence of the president and the vice-president, Hon. Matt. Anderson was called to the chair. On motion, Mr. Trelease was elected secretary *pro tem*.

On motion of Mr. Kellogg, Hon. B. F. Adams and the acting secretary were appointed a committee to prepare suitable resolutions relative to the bereavement of the Society in the case of its late efficient secretary, for presentation at the annual meeting.

Professor Trelease was formally elected *ad int.* secretary of the Society, to fill the vacancy caused by the death of Mrs. Lewis, on motion of Mr. Kellogg, and consented to serve in that capacity until the annual meeting.

A motion introduced by Mr. Kellogg, authorizing the payment to Mr. Lewis, of the salary which would have become due our late secretary had she lived until the end of the year, was carried.

The part to be taken by the society in the New Orleans Exposition was brought up for informal discussion, and President Smith, who came in at about this time, read a communication from Hon. Parker Earle on the classes in which the Society might compete for premiums. In response to inquiries, members from different sections of the

state expressed their opinion as to the amount of fruit likely to be available for exhibition during the winter.

The following report of the judges on fruit now on exhibition at the state fair, was presented by Mr. Pilgrim, on behalf of the executive committee of the State Agricultural Society, with the request that the judges be instructed by the Horticultural Society:

"We find that the premium list for the state fair calls for separate collections for sweepstakes. Part of your exhibitors have brought such collections and found table room; others have collections which cannot be displayed for want of tables and plates; still others have entered for sweepstakes without presenting separate collections, under the impression that this was allowable under the old rules of the society. What shall we do?"

GEO. J. KELLOGG,  
*Chairman Committee, Class 33."*

On motion, the subject was placed before the society for discussion, after which the call for separate sweepstake collections was decided unnecessary for the present fair.

A motion of Mr. Kellogg, authorizing the judges in this department to request the Agricultural Society to strike out the clause requiring such collections for future exhibits, was carried.

Mr. Kellogg introduced a motion, which was carried, requesting the Agricultural Society to define "best," as applied to fruit exhibited at the state fairs, in accordance with the exhibition rules of the Horticultural Society.

President Smith stated that about \$100 could be spared for premiums at the annual meeting of the Horticultural Society, if it were thought best to call out a fruit display at that time.

On motion, the society decided to hold a fruit exhibition in connection with the February convention; and the president and secretary were authorized to prepare a premium list for that meeting.

The society adjourned *sine die*, at 9 P. M.

TRANSACTIONS AT THE ANNUAL MEETING AT  
MADISON, FEBRUARY 2-6, 1885.

CAPITOL, February 2, 1885.

The society was called to order by the president at 7:45 P. M.

On motion, the following committee on programme was announced — Geo. J. Kellogg, A. L. Hatch, H. Floyd.

The following delegates were in attendance on the convention:

Peter M. Gideon and J. S. Harris, Minnesota State Society.

J. S. Harris, Northwestern Horticultural Society.

J. Wakefield, Waupaca Co. Horticultural Society.

On call of the president, the secretary read the following report, which was accepted and ordered printed.

SECRETARY'S REPORT.

The sad death of our late secretary, Mrs. Lewis, makes it again my duty to briefly report on the condition of the society, its work and its needs.

Unfortunately, I was so closely confined by my University duties during the early part of the year that I am unable to report in detail upon the work of the society during this time; but I may say that when I resumed active work in the fall I found indications of careful thought and conscientious work on the part of one who, had she lived, would have done much for the future of this organization. Much of the work planned by Mrs. Lewis necessarily stopped at her death, through the inability of one not familiar with it to continue it at once.

Owing to the press of legislative printing, it is doubtful whether we can hope to distribute the next volume of our TRANSACTIONS much, if any, before our next annual meeting, as the spring will be well advanced before the printer can attend to it, although the copy could be placed in his hands within a few weeks if it could be used.

For several years we have noticed an increased demand

for our reports by societies of similar aims to our own. So far as it has been possible, such requests have been met promptly, and the exchanges thus inaugurated have proved beneficial to this society.

Frequently letters come from former residents of Wisconsin, who have removed to the newer west, and who naturally turn to their native state for aid and encouragement in their efforts to surround their new homes with orchards; much as many of you turned to the experienced fruit growers of the east for similar help a quarter of a century or more since. The conditions under which many of them work are so similar to those prevalent in Wisconsin that we confidently believe that they can profit by your experience much more than you could by that of eastern orchardists; and the numerous extensive failures, reported in our volumes, carry a lesson of caution which can be read between the lines of every page when not explicitly stated. That this is appreciated is testified by cordial letters from the newer states.

The increasing demand for our volumes suggests a subject presented at our last annual meeting, which should not be forgotten now. I refer to the urgent necessity for some change in our publication law. While this provides for the printing of a larger number of copies than have ever before been issued, it places but five hundred in our hands for distribution, and your hearty support should be given to the committee to which the matter was referred last winter. It is to be remembered that the Dairymen's Association and the Experiment Station of the University are also in need of a larger number of separately-bound volumes of their reports than they now receive, and by combined action with their representatives your committee should be able to convince the legislature of the wisdom of continuing the generous edition now printed, while allowing a much greater number of separate copies for the use of each of the organizations contributing matter to the joint report, as has been recommended by our liberal-minded Governor in his last message.

In pursuance of its past policy the society has steadily worked for the advancement of the horticultural interests

of the state, and we are gratified by reports showing that it has met with no small degree of success, though much remains to be done. Existing local societies are in need of more active personal help than is now given them; and new societies should be formed in every section of the state. Each member of the State Society should give thought to this matter, beginning his work in his home neighborhood; and your secretary and other officers should hold themselves ready to respond to any and all appeals for their presence whenever it can be productive of good.

Under the present law each county society reporting to us is entitled to twenty-five copies of the joint report containing the transactions of this society. This number is too small for the use of several societies which now send in their reports, and a larger number could profitably be placed in the hands of all, for their members know where and how to use the volumes to best advantage in the sections in which they live.

Town societies, which can also be made of much local interest and profit, are unable to obtain our reports, no provision being made for them under the present law. Both of these facts should be urged upon the attention of the committee on publications appointed by this society.

A young, or, more properly, undeveloped interest, which promises in the near future to be of great importance to the state, is to be brought before this convention by Mr. Morgan's paper on cranberry culture. A demand for help in the pioneer work they are doing is made by the men now engaged in developing this industry. To help them by bringing within their reach the results of others who have gone over the same ground elsewhere, and to preserve the records of their successes and failures for future use, are objects which come within the legitimate field of this society, and should be identified with its other work.

Now that the capitol extension is completed, we may hope for permanent quarters in it, and one of the first things that should demand the attention of your secretary is the arrangement and improvement of the library, and the



proper display of a set of models of the fruits adapted to Wisconsin.

Closely connected with this is the question of fruit displays at the meetings of the society, and at state and county fairs. Whatever other interest such displays may have, it may safely be said that their primary object is, and should be, the education of the public in the appearance and characters of fruits adapted to our climate. To this end, greater care should be taken to provide every plate exhibited with a legible card bearing its name, which our able committee on nomenclature will see is correct. Several practical questions concerning the advisability of duplicating varieties in grouped collections of showy or adapted fruit, and the more exact definition of terms in the premium lists of this and the State Agricultural Society are to be brought up by members of the society and are deserving of careful consideration. The decisions reached should be plainly stated in our rules of exhibition.

The several plans touched upon as worthy of thought demand not only enthusiastic work, but money, and every member of the society should do whatever may be in his power to sustain the committee appointed last winter to solicit more financial aid from the state. With the present aid accorded us, little can be accomplished, and progress must of necessity be very slow. But with greater possibilities of work, I am hopeful that the society will accomplish much, not only for the commercial prosperity of a large class of our citizens, but for the increase of the home comforts of a much larger class, who think that a farmer's time is too precious to be spent in getting anything from the soil but more soil with which to acquire more soil, while the comforts that might be added to their lives by a very little exertion are never thought of as within their reach or worthy of the least effort.

Respectfully submitted,

WILLIAM TRELEASE,

*Secretary.*

February 2, 1885.

On motion of Mr. Kellogg, the president of the society was requested to confer with the legislative committee on claims with respect to the bill for an appropriation for this society for the next two years.

The treasurer's report, showing a balance on hand of \$131.82, was read, and referred to the finance committee.

At the request of the chair, the memoir of the late Mrs. Lewis, which appears elsewhere, was read by Hon. B. F. Adams, on behalf of the committee appointed in September.

On motion of Mr. Kellogg this report of the committee was adopted by a rising vote.

On motion of Mr. Kellogg a copy of the report of the committee was ordered transmitted to the family of the deceased lady, whose death is felt as a personal bereavement by nearly every member of the society.

The following resolution, introduced by Mr. Hatch, was unanimously carried:

*Resolved*, That as a slight token of the esteem in which the memory of the late Mrs. H. M. Lewis is held by this society, the secretary is hereby instructed to cause copies of this volume to be handsomely bound, with a suitable presentation page in each, and to present one of the same to each member of the family of Mr. Lewis.

On recommendation of the secretary, Article V, of the constitution of the society was amended so as to read as it now stands, the amendments being verbal changes, designed to harmonize this article with section 4 of the act of reorganization of the society.

The society adjourned at 9 o'clock, to 9 A. M., of Tuesday.

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CAPITOL, February 3, 1885.

The society was called to order at 9:15 A. M., president Smith in the chair.

The committee having reported no programme for the convention, the society proceeded to transact such business as was presented.

The premium list for the State Fair was received by the Horticultural Society for revision, and on motion of Mr. Kel-

logg, was referred to the following committee, appointed by the chair: Geo. J. Kellogg, A. L. Hatch and B. F. Adams.

The following resolution, introduced by Mr. Hatch, was adopted:

*Resolved*, That each exhibit shall be so placarded or labeled as to show the name and postoffice address of the grower.

On motion of Mr. Hatch, Article III. of the constitution was amended by making the secretaries of local horticultural societies members, *ex-officio*, of the state society.

The society then proceeded to a revision of the fruit list.

#### APPLES.

A motion to strike the Pewaukee from the list of seven adapted varieties, was lost by a single vote, the sentiment of a majority of the members present being, that while the trees of this variety are hardy and bear well on the original soil, it is not adapted to many localities.

The Wolf River was discussed at some length, the opinion of Mr. Jeffery being that it was inferior to the Fall Orange. This variety, however, contributed largely to the success of the society at the New Orleans Exposition.

Mr. Hatch spoke of McMahon's White, stating that it should appear in the list of varieties for trial under general conditions, as he considered it perfectly hardy, and no better adapted to sandy soil than to others. The same statements were advanced by Mr. Hatch and Mr. Tuttle with respect to the Orange Winter, and on motion both were placed in the second list.

On a motion to strike out Walbridge it appeared that on basswood soil in certain localities the variety is hardy, although not generally doing well throughout the state. Mr. Adams remarked that in the vicinity of Madison, though a fair bearer, it has of late shown a tendency to scab (*Fusicladium*), which yearly becomes more troublesome. The motion was lost by but two votes.

Price's Sweet was removed from the list, on motion, as it is believed to be the worst variety formerly named there.

## STRAWBERRIES.

The Bidwell was believed by Mr. Hatch, Mr. Adams, President Smith and others to have had nearly sufficient trial to require removal from the trial list, as being thus far a poor fruiter and especially susceptible to frost and other unfavorable conditions; but as some of the speakers thought that it might ultimately prove of value, a motion to strike it from the list was lost by a nearly unanimous vote.

On motion of Mr. Kellogg, the Manchester was added to the trial list, being also retained on the special list. Mr. Smith and others spoke very favorably of the variety, Mr. Kellogg rejoicing in President Smith's alleged discovery that there was a possible better variety than the Wilson, which, however, was not fully admitted by Mr. Smith.

Mr. Harris and several other members objected strongly to the Sharpless as a nearly worthless variety, calculated to mislead planters if allowed to remain on the recommended list. The general testimony was that it is great in promise but always disappointing, and on motion it was canceled by a unanimous vote.

## GRAPES.

A motion of Mr. Hatch to add the Champion to the general list was lost, the quality of the fruit being considered inferior to that of the Janesville, while it is little earlier, and has been fruited by but few members of the society. Mr. Gideon thought that few men would eat either this or the Janesville when Worden and Brighton can be had at about the same time; but it was claimed by Mr. Hatch that both of the former varieties are adapted to the early market and may be relied on for profit.

Mr. Tuttle reported the Janesville as especially liable to rot, of late years; but Mr. Jeffery, Mr. Hatch and others thought that the general endurance of the variety, rendering its successful growth possible by the inexperienced, adapts it particularly to general culture by others than professional vineyardists, and thus gives it a decided worth.

On motion of Mr. Harris, the Janesville and Champion

were placed in a special list for frosty and unfavorable localities.

#### RASPBERRIES.

Mr. Gideon stated that the Gregg does well in Minnesota, on a northern exposure, where the Miami is of little value.

Mr. Kellogg favored the removal of Tyler and Souhegan to the recommended list, but the experience of the society was judged insufficient to warrant the recommendation as yet.

The Philadelphia was claimed by Mr. Kellogg to be valuable in small gardens because of its slight habit of spreading, but Mr. Adams and others regarded it as a very poor variety for Wisconsin, with little hardiness.

On motion, it was stricken from the list by a unanimous vote.

#### BLACKBERRIES.

Mr. Kellogg reported the Ancient Briton blackberry as doing remarkably well about Ripon, where it is largely grown, while it does better with winter protection.

Mr. Adams and Mr. Tuttle stated that it does well as far north as Madison and Baraboo without protection. Stone's Hardy and Snyder have proved less resistant to cold winters than the Ancient Briton with Mr. Tuttle, while the latter was generally conceded to be a better fruit in appearance. According to Mr. Kellogg, neither of these three varieties will stand a temperature of more than  $-25^{\circ}$  without receiving serious injury, unless protected.

Mr. Hatch spoke of a new variety of the wild blackberry under cultivation by himself and Mr. Adams, which gives promise of good and plentiful fruit, while it is perfectly hardy. It is proposed to place it in the hands of other horticulturists in a few years, for more extended trial.

Mr. Adams reported favorably on the Dewberry, recommended for trial. The fruit is very large and sells well, and, the trailing vines being covered by snow, they appear to be hardy; but it was thought well to cover them lightly to prevent possible injury. The berry ripens very early and is considered a superior fruit by purchasers.

Mr. Jeffery stated that the Flemish Beauty pear cracks so badly nearly every season as to deserve nothing further than recommendation for trial, but the society allowed it to stand because of its success in favorable localities.

## PEARS.

The Kieffer was discussed at some length, but the sentiment of the members present was that it is not sufficiently hardy to promise success in the state, while Mr. Smith confirmed the general opinion as to its worthlessness for all purposes but preserving; describing its flavor as intermediate between that of an artichoke and a raw potato.

## PLUMS.

Mr. Harris reported favorable on another year's experience with the Cheney plum, which yields large fruit of good value for the early market, about La Crosse. The variety originated in the western part of the state, from a stray seedling of common parentage, but showing characters of the *Prunus americana* type.

## TREES.

On motion a list of trees for road side planting was adopted and added to the recommended lists.

On motion a list of nut-bearing trees was also added.

By vote the secretary was instructed to insert the botanical names of the plants recommended for culture in the lists of the society.

Adjourned to 1:30 P. M., at 12:15.

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CAPITOL, February 3, 1885.

The society was called to order at 2 P. M., President Smith in the chair, and proceeded to the election of officers, after making Mr. J. S. Harris an honorary annual member.

On an informal ballot for president, J. M. Smith received 10 votes and J. S. Stickney, 3. This vote was then made formal and unanimous in favor of Mr. Smith.

The ballot for vice-president not giving a majority to any one candidate, the second ballot resulted in the election of B. F. Adams.

The present secretary was re-elected.

On motion, the secretary was instructed to cast the vote of the society for B. S. Hoxie and Matt. Anderson to fill respectively the offices of corresponding secretary and treasurer for the following year.

On motion, the secretary was directed to cast a ballot for B. F. Adams as superintendent for the coming year.

The following members of the executive committee were then elected:

District.	District.
1. S. Hunt, Evansville.	5. W. Reynolds, Green Bay.
2. Geo. C. Hill, Rosendale.	6. Mrs. D. Huntley, Appleton.
3. B. F. Adams, Madison.	7. A. G. Tuttle, Baraboo.
4. J. S. Stickney, Wauwatosa.	8. E. G. Partridge, Warren.

9. Wm. A. Springer, Fremont.

The following committee on Nomenclature and New Fruits was elected:

J. C. Plumb,                      Geo. P. Pepper,                      A. L. Hatch,

The committee of Observation was then elected, as follows:

District.	District.
1. G. J. Kellogg, Janesville.	5. H. Floyd, Berlin.
2. G. C. Hill, Rosendale.	6. D. Huntley, Appleton.
3. B. F. Adams, Madison.	7. Wm. Toole, North Freedom.
4. J. S. Stickney, Wauwatosa.	8. E. G. Partridge, Warren.

9. W. A. Springer, Fremont.

The present Finance committee was re-elected.

The president's report was then called for, and Mr. Smith presented the following:

## PRESIDENT'S ADDRESS.

*Members and Friends of the Wisconsin State Horticultural Society:*

My time has been so completely occupied for a number of months past that in place of an opening address at our annual convention, I must content myself with asking you to accept a short report of our work at the World's Exposition now in progress at New Orleans. At the last annual meeting of the society, it was resolved to make an attempt to get up an exhibition of the fruits of the state at the World's Exposition then in contemplation. You passed a resolution instructing me to appoint the necessary committee to carry on the work. After my appointment as the alternate commissioner, with Mr. E. D. Holton as the commissioner, we had a conference and resolved to appropriate a sum not to exceed \$1,000, for the purpose of a fruit exhibition at New Orleans. I promised Mr. Holton that it should be a good one, and he turned the entire control of it into my hands. After some deliberation in my own mind, I asked Mr. J. C. Plumb, and Mr. George P. Pepper to accept the positions as the committee to gather the fruits, trees, plants, shrubs, etc., for the exposition. They accepted the positions, and divided the work between themselves, Mr. Plumb taking the fruit department, and Mr. Pepper the balance of the work. The understanding was that all necessary cash outlays should be paid but no pay allowed for the time spent in the work.

Arrangements for cold storage of our fruit were made in Milwaukee, and its collection was commenced in September and continued until in November. After it was nearly or quite all in, I visited the cold storage rooms, and found a large amount of fruit there. I supposed, as a matter of course, that it all belonged to our state society collection.

After the arrival of the fruit in New Orleans, I ascertained that instead of all the fruit belonging to the state society collection, as I had supposed, a large share of it was Mr. Pepper's private collection, another large share belonged to



Mr. Wm. Springer, still another share was claimed by Mr. Plumb's son, thus leaving the share belonging to the society but a small proportion of the whole, and utterly inadequate either for filling the entries that I had made, or for making a creditable show.

This was all the more annoying from the fact that I had been very earnest in my desire to have a very large and fine collection, and had been repeatedly assured that the fruit should be there, and that it should be very fine. Mr. Holton had also received the same assurances.

As some considerable time seemed to be necessary in the collection of the fruit, I allowed the rule of not allowing any pay for time to be broken, and Mr. Plumb drew from time to time for his services previous to leaving the state, \$54.00. I allowed these bills with others that were legitimate, because of my anxiety to have a fine display of Wisconsin apples at New Orleans.

After ascertaining just what our situation was, and that a fine showing by our society without the aid of the collections of Mr. Peffer and Mr. Springer was impossible, I proposed to them to waive their private entries and let me have their fruit for the benefit of the society. I was very anxious to make the entries for the best varieties adapted to the extreme north, and told them that in case we took any of those premiums I would allow them to have the money and our society would take the medals.

They both acceded to my request at once, and by their aid our society has made a splendid showing, and we have come out with high honors. The following will show our position as compared with our competitors.

Our district embraced all of the country east of the Rocky Mountains and north of 40°. This of course covers nearly all of the great apple growing districts east of the Rocky Mountains. There were fourteen states present with their apples for competition. There were seventy-nine premiums awarded. Of this number, Maine took four, Vermont one, New Hampshire none, Massachusetts none, Connecticut three, Pennsylvania one, Ohio two, Illinois eleven, Michigan

nine, Iowa thirteen, Nebraska seven, Minnesota two, Canada two, Wisconsin twenty-four.

Seventeen medals were awarded, of which we have six.

Mr. Pepper and Mr. Springer worked most earnestly and faithfully in setting up and preparing the fruit for the exhibition. The same may be said of Mr. J. P. Roe of Oshkosh. I trust that some suitable acknowledgment of their generosity and faithful aid will be placed upon the records of our society.

"I send inclosed a list of our premiums on trees and shrubs at New Orleans. They were collected here, and set out and arranged there by Mr. George P. Pepper of Pewaukee. I have not the premium list at hand although it is safe to say that no state or society has equalled us in the list of premiums. I am in receipt of a letter, giving a number of additional horticultural premiums taken by the Wisconsin Society as follows: For premiums on trees and shrubs—best collection of crabs, \$20; best collection of plums, \$25; best collection of fruit trees adapted to the northwest, silver medal and \$100; best collection of all kinds of fruits, etc., silver medal and \$100; best collection of evergreens north of 35°, silver medal and \$100; best collection of fir, medal and \$25; best collection of juniper, silver medal and \$25; best collection of Thuja, silver medal and \$25; best single pine tree, \$10; handsomest arbor vitae, \$10; best collection of viburnum, \$10; best collection of shrubs adapted to the northwest, \$50; one hundred varieties of North American trees against the world, gold medal and \$200. Mr. Geo. P. Pepper, of Pewaukee, who was left in charge of the horticultural exhibit, has written me conveying this information.

Yours truly,

J. M. SMITH."

Mr. Pepper performed the work of selecting, putting up and shipping the trees and shrubs to my entire satisfaction. The premiums upon them have not yet been awarded; but we stand a fair chance of getting our share of them. [The following letter which was afterward sent to the *Western Farmer*, should be quoted in this connection:—ED.]

The premiums already awarded us amount to \$400, and I shall be rather disappointed if the amount is not increased to at least \$500. We also have a pleasant showing of apples in our collective exhibit in the government building.

Such in brief is the result thus far of our work at the largest Horticultural exhibition ever seen upon this continent if not in the world.

Notwithstanding my disappointment at first, the outcome of the exposition has been satisfactory. "All's well that ends well."

With fourteen competitors we have had awarded to us nearly one third the entire number of premiums, a trifle over one third of the medals, and about one third of the money awarded in our department. Of all the new varieties of apples upon exhibition, none excited so much attention as the Wolf River, though other varieties were noticed more or less. Taking the exhibition altogether there is no doubt but that Wisconsin stands very much higher to-day, and I firmly believe, justly so as a fruit growing state, than she ever did before. And after hearing the reports of failures and losses in other states I am better satisfied than ever before that we have not only a good state to live in, but a good state in which to grow all the fruits adapted to northern climates.

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On motion of Mr. Kellogg, the president's report was laid upon the table until evening, and the society adjourned at 3 o'clock to attend a meeting of the executive committee of the State Agricultural Society, called to listen to arguments on the question of excluding intoxicating beverages and games of chance from the next state fair, after passing a resolution requesting their exclusion.

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CAPITOL, February 3, 1885.

The society reconvened at 7 P. M., President Smith in the chair.

Mr. Kellogg called up the president's report for consideration and adoption.

Mr. Plumb and others spoke briefly on the subject of the report, after which Mr. Hatch introduced the following resolution, which was unanimously carried:

*Resolved*, That the thanks of the Wisconsin State Horticultural Society are hereby tendered to Commissioner E. D. Holton, President J. M. Smith, and to Mr. Geo. Pfeffer, Mr. Wm. Springer, and Mr. J. P. Roe for efficient help and untiring zeal in making the Horticultural Exhibit for Wisconsin at the World's Fair at New Orleans a success.

*Resolved*, That as a token of our esteem the secretary be instructed to have a sufficient number of volumes of this year's transactions bound in gilt binding with an appropriate page bearing this resolution, and to present a copy to each of the above-named gentlemen.

The treasurer's report, which follows, was reported correct by the finance committee, and on motion, it was adopted and ordered published.

## TREASURER'S REPORT.

## RECEIPTS.

Feb. 4, 1884.	Balance in treasury.....	\$6 22	.....
Feb. 6, 1884.	Received of state treasurer.....	500 00	.....
Feb. 6, 1884.	Membership dues, from the secretary.	43 00	.....
April 4, 1884.	Membership dues, from the secretary.	10 00	.....
Aug. 15, 1884.	Membership dues, from the secretary.	3 00	.....
Sept. 18, 1884.	Membership dues, from Wm. Reid...	1 00	.....
		<hr/>	
			\$563 22

## DISBURSEMENTS.

Feb. 7, 1884.	J. G. Kellogg, delegate to Illinois convention.....	\$3 09	.....
Feb. 7, 1884.	J. M. Smith, expenses at Green Bay...	22 00	.....
Feb. 7, 1884.	Wm. Trelease, salary, expenses of Mrs. Tilson and postage .....	32 50	.....
Feb. 7, 1884.	F. H. King, railroad fare, Ripon meeting	14 45	.....
Feb. 7, 1884.	J. M. Smith, incidental expenses .....	25 00	.....
Feb. 7, 1884.	Expenses of delegates from Minnesota	7 00	.....
Feb. 7, 1884.	Geo. J. Kellogg, overpaid dues.....	1 00	.....
Feb. 7, 1884.	Mrs. H. M. Lewis, postage.....	5 00	.....
Feb. 7, 1884.	Geo. P. Pfeffer, delegate to Des Moines	25 95	.....
Feb. 18, 1884.	A. J. Philips, delegate to Minneapolis..	8 60	.....
March 11, 1884.	J. C. Plumb, expenses at Baraboo meeting .....	\$5 00	.....
March 13, 1884.	Mrs. H. M. Lewis, incidental expenses.	20 00	.....
May 15, 1884.	Mrs. H. M. Lewis, salary.....	25 00	.....
June 25, 1884.	Mrs. H. M. Lewis, expressage .....	85	.....
June 25, 1883.	Premiums paid at La Crosse.....	50 00	.....
June 25, 1884.	J. M. Smith, expenses at La Crosse....	12 38	.....
June 25, 1884.	B. S. Hoxie, expenses at La Crosse....	11 00	.....
June 25, 1884.	Mrs. V. H. Campbell, expenses at La Crosse .....	22 84	.....

June 25, 1884.	J. C. Plumb, expenses at La Crosse....	8 18	.....
June 25, 1884.	A. G. Tuttle, expenses at La Crosse...	2 80	.....
June 25, 1884.	Geo. J. Kellogg, expenses at La Crosse.	8 35	.....
June 25, 1884.	Mrs. H. M. Lewis, expenses at La Crosse .....	7 11	.....
June 25, 1884.	Mrs. H. M. Lewis, expenses of society, postage, etc.....	15 00	.....
June 25, 1884.	C. Hirschinger, expenses at La Crosse.	4 50	.....
June 25, 1884.	Mrs. Isaac Clark, expenses at La Crosse	1 30	.....
June 25, 1884.	Geo. P. Peffer, expenses at La Crosse..	7 50	.....
Aug. 7, 1884.	Mrs. H. M. Lewis, salary.....	25 00	.....
Sept. 25, 1884.	H. M. Lewis, salary due Mrs. Lewis ...	50 00	.....
Nov. 18, 1884.	Schmitz Bros. & Co., label holders ....	10 00	.....
			<u>\$431 40</u>
Jan. 3, 1885.	Balance in treasury .....	131 82	<u>.....</u>

The committee on finance to whom was referred the above report, have examined the same, with the accompanying vouchers, and report the account correct.

H. C. ADAMS,  
N. N. PALMER,  
B. S. HOXIE.

After listening to a paper on fungoid plant diseases, read by A. L. Hatch, of Ithaca, the society adjourned at 8 o'clock to the following evening, to listen to the address of President Arnold, of the Agricultural Society.

CAPITOL, February 4, 1885.

The society was called to order at 7:15 P. M., the President in the chair.

The President presented a communication from the Wau-paca County Horticultural Society, inviting the State Society to meet with that society in June next at Weyauwega. On motion, the invitation was cordially accepted, by a unanimous vote.

The report of the committee on a premium list for the state fair was called for, and presented by Mr. Kellogg. On motion, the report was ordered transmitted to the Agricultural Society, by whom it was originally referred.

The usual appropriations of \$25.00 for incidental expenses of the President, and \$100.00 for the salary of the Secretary, were voted.

On motion the Secretary's salary was voted increased to \$200.00 annually, provided the appropriation of \$1,000.00 should be made by the legislature to the society, as recommended by the Governor.

On motion of Mr. Hoxie, the Secretary was authorized to employ a reporter for the conventions of the society, provided increased appropriations were received.

On motion, Hon. H. C. Adams was continued as a committee of one to further confer with the Governor with respect to the assignment of rooms in the Capitol, which the committee had so far been unable to secure.

The following resolutions were adopted by a vote of the society:

*Resolved*, That we favor the binding of the transactions of our society in separate volumes; and that not less than three thousand five hundred volumes, of 350 pages each, be printed, to be disposed of according to the law of 1879.

*Resolved*, That we favor the former appropriation of \$150.00 annually for the illustrating of said volume.

On the motion of Mr. Adams a premium of \$1.00 awarded Mr. M. E. Emerson in 1883, but not then claimed, was ordered paid.

On motion of Mr. Kellogg, the expenses of displaying fruit at the annual convention were ordered paid.

The society then listened to an instructive paper by J. S. Stickney, of Wauwatosa, which was followed by a discussion reported elsewhere.

On motion, the following report of the committee on awards was read and adopted, a vote of thanks being tendered the judges.

## REPORT OF THE COMMITTEE ON AWARDS.

*To the Honorable President and Members of the Wisconsin State Horticultural Society:*

We, the committee selected by you to make awards upon the articles on exhibition at this convention, have given them a careful examination and discharged the duty imposed upon us according to our best judgment and know-

ledge of the adaptability of the varieties to cultivation in this state, and reported upon the same.

In addition, we beg leave to make mention of the splendid show upon the tables, from which the prize selections have been taken, of four hundred and fifteen plates in seventy-three varieties of apples, nearly all in good merchantable condition and of fine appearance; four plates of pears and twenty-two of grapes, one sample of amber cane syrup, and samples of boiled cider, cider, apple sauce and pure apple jelly, altogether making a collection so tastefully arranged as to reflect honor upon the tact, industry and perseverance of the exhibitors, and credit to the state possessing such ample resources and a people having the skill and intelligence to develop the same.

The exhibition must prove a fruitful source of good to the whole people of this great state, and will encourage the members of the State Horticultural Society to renewed efforts in the prosecution of horticulture that shall crown their labors with lasting renown.

The only lacking feature in the exhibition was a display of flowers.

PETER M. GIDEON,  
JOHN S. HARRIS,  
WM. TOOLE.

#### PREMIUMS AWARDED AT THE ANNUAL MEETING AT MADISON, FEBRUARY 2-6, 1885.

Best ten varieties of winter apples adapted to Wisconsin, H. Floyd, Berlin.....	\$6 00
Second best, C. Hirschinger, Baraboo .....	4 00
Third best, G. J. Kellogg, Janesville.....	2 00
Best five varieties of winter apples adapted to Wisconsin, C. Hirschinger, Baraboo .....	3 00
Second best, H. F. Marsh, Sun Prairie.....	2 00
Third best, H. Floyd, Berlin.....	1 00
Best five varieties of fall apples, with written statement of manner of keeping, H. Floyd, Berlin.....	3 00
Second best, C. Hirschinger, Baraboo.....	1 00
Third best, G. Jeffery, Milwaukee .....	50
Best display of showy apples, not to exceed ten varieties, C. Hirschinger, Baraboo .....	3 00
Second best, H. Floyd, Berlin.....	2 00
Third best, G. Jeffery, Milwaukee.....	1 00

Best plate Alexander, C. Hirschinger, Baraboo .....	\$1 00
Second best, G. Jeffery, Milwaukee .....	50
Best plate Ben Davis, H. F. Marsh, Sun Prairie .....	1 00
Second best, Wm. Reid, North Prairie .....	50
Best plate Fameuse, H. Floyd, Berlin .....	1 00
Second best, C. Hirschinger, Baraboo .....	50
Best plate Golden Russett, C. Hirschinger, Baraboo .....	1 00
Second best, A. L. Hatch, Ithaca .....	50
Best plate Haas, C. Hirschinger, Baraboo .....	1 00
Second best, G. J. Kellogg, Janesville .....	50
Best plate Northern Spy, H. F. Marsh, Sun Prairie .....	1 00
Best plate Orange Winter, A. L. Hatch, Ithaca .....	1 00
Best plate Pewaukee, C. Hirschinger, Baraboo .....	1 00
Second best, H. Floyd, Berlin .....	50
Best plate Plumb's Cider, H. Flood, Berlin .....	1 00
Second best, C. Hirschinger, Baraboo .....	50
Best plate Tallman Sweet, C. Hirschinger, Baraboo .....	1 00
Second best, H. Floyd, Berlin .....	50
Best plate Utter, H. Floyd, Berlin .....	1 00
Second best, C. Hirschinger, Baraboo .....	50
Best plate Walbridge, C. Hirschinger, Baraboo .....	1 00
Second best, H. Floyd, Berlin .....	50
Best plate Wealthy, M. E. Emerson, Door Creek .....	1 00
Second best, H. Floyd, Berlin .....	50
Best plate Westfield Seek-No-Further, C. Hirschinger, Baraboo .....	1 00
Second best, H. F. Marsh, Sun Prairie .....	50
Best plate Willow Twig, H. Floyd, Berlin .....	1 00
Second best, B. S. Hoxie, Evansville .....	50
Best plate Wolf River, Wm. Spinger, Fremont .....	1 00
Largest and best display of Crab Apples, C. Hirschinger, Baraboo .....	2 00
Largest and best display of Pears, Geo. Jeffery, Milwaukee .....	2 00
Largest and best display of open-air Grapes, with written statement of method of keeping, Wm. Ried, North Prairie .....	3 00
Second best, A. L. Hatch, Ithaca .....	2 00
Largest and best display of Fruit, all kinds, C. Hirschinger .....	4 00
Second best, Geo. Jeffery, Milwaukee .....	3 00
Third best, H. Floyd, Berlin .....	2 00

Mr. Hatch — I should like to hear from Messrs. Harris and Gideon, of Minnesota.

Mr. Harris — Mr. President and gentlemen of the Wisconsin State Horticultural Society. We bring to you the hearty greetings of the members of the Minnesota Horticultural Society, and their best wishes for your success in this meeting, and the growth and prosperity of your Society in the future. We come to you, not to make pretty speeches, but to learn from you some of the whys and wherefores of your success in fruit culture, and to get an insight into your methods and management, that we may be able to carry to our friends words of encouragement. There is no other kindred society in which we feel so deep and lively an interest as in yours. We look upon you as more than our neigh-



bor, as our sister just a little older according to date of birth, but each about equal in rich, ripe experiences and failures in fruit culture. In the past our disasters may have been greater than yours, and that would have a tendency to age us sooner, but we do, and ever shall, cherish a deep veneration and warm friendship for the old veterans of your society, who have given the best years of their lives to experiments for the development of the possibilities of horticulture in the northwest, and every success that has followed their noble work has made us glad. We have never felt the pangs of jealousy, but we are a little vain and often think that our Minnesota is destined to get ahead of your Wisconsin; but when troubles and disasters overtake us, as they have very frequently in the past, there is and has been no other friend we feel so like looking to for sympathy and council as our elder sister, Wisconsin.

More than one half of your state possesses a climate and soil very similar to ours, and so far is about as unfavorable for the successful production of the favorite varieties of the fruits of the Middle and Eastern states as our own. We know that your skilled and practical men are engaged in originating new varieties and experimenting with the old for the purpose of finding something adapted and that may be profitably grown in that region, and we cherish a hope that when you have found it it will also be congenial to our soil and climate. Several times in the past it has been our happy privilege to welcome prominent members of your society to sit with us in our annual councils and join in our deliberating and they have done us good. Several times my friend Gideon, myself and others of our members have enjoyed the privilege of attending your annual meetings and we have always been exceedingly well received and most hospitably entertained and it has resulted in no harm to us, and we do hope that the most friendly relations may continue to exist between the two societies. But I warn you that we shall try very hard to be the biggest sister in the near future, and I do not know but we are now, for I really think that our Wealthy apple is a little better than your Wolf River; any way the name is suggestive.

However, we are not going to stop with the Wealthy. We are starting several experimental stations and hope soon to enlist every farmer, farmer's wife and sons and daughters in the state into the rank and file as experimenters, and then if we do not succeed we may come over the line for recruits.

Our late annual meeting, held at St. Paul two weeks since, was an interesting and profitable one—more so than we had expected under the circumstances. It was feared that the great World's Exposition in progress at New Orleans would overshadow everything else, and on the strength of that the meeting was not extensively advertised, and our secretary, probably to help us out, called the meeting jointly with the State Amber Cane Association, without a programme or any order of business, or provision for a single address, paper or report. Four days before the opening of the meeting we arranged a hasty programme and appealed directly to the individual members to turn out and bring along something to help make the meeting interesting. As a result, we had a spirited meeting, and a fair attendance of members, and we also had a fine exhibition of fruits, vegetables and seeds. We believe that we are making some progress in horticulture, and that we have gained the confidence of our people. We expect to see more and more of a horticultural taste cultivated among our farmers, and to see them improving their homes and home surroundings, and to see good fruit so plenty and cheap as to be within the reach of all classes for every-day consumption. Our friend Tuttle was present during the entire meeting, and we felt that we were very much benefited by his presence, but we greatly missed the genial Peffer.

Finally, we are glad that your state has won such laurels in the horticultural department at the World's Exposition. There is but one other state in all the Union that we had rather had taken the prizes, and I own that we are a little disappointed; but never mind, some day she shall beat you, and I hope you will be as proud of it as we are of your success at this time. We believe that the honors have been richly earned and the awards honorably and fairly given.

I would also congratulate you upon the exhibit made in connection with this meeting—it is the most complete and best show of apples that has ever been made at this season of the year in the northwest, and will reflect credit upon you as a horticultural society. No wonder that you beat the world at New Orleans. And now I will extend to you one and all an invitation to come and see us in the home of the Wealthy apple. Our next annual meeting will be held at Minneapolis, commencing on the third Tuesday of January, 1886.

A motion authorizing the secretary to pay \$25.00 to the Mississippi Valley Horticultural Society for fifty copies of Volume 2 of their Transactions, for use by this society, was here introduced and carried.

The following resolutions, introduced by Mr. Plumb, were unanimously adopted by the society, and the secretary was instructed to secure a fitting memoir of the deceased:

WHEREAS, In the order of nature and Providence, Charles Downing, of Newburg, New York, has been called from the labors of this world to the higher life, it is hereby

*Resolved*, I.—That in the deceased we have lost from our ranks one who justly stood first in our country and second to none in the world, in pomological literature. And one to whose untiring research we are indebted for the present perfection of that great work, "Fruit and Fruit Trees of America," commenced by his brother, the lamented A. J. Downing, many years ago.

II.—That the character of the deceased as known by his life and labors, is worthy of our emulation, and is especially commendable to students of horticulture and pomology everywhere.

III.—That we, members of the Wisconsin State Horticultural Society, hereby extend our sympathies to the friends of the deceased, and express our hope that in due time the many unpublished but invaluable records of Mr. Downing's life work may be added to that already now before the public.

IV.—That a copy of these resolutions be sent to the friends of the deceased, and also be published with a memorial paper in the next volume of our report.

The following resolutions, introduced by Mr. Kellogg, were unanimously adopted.

*Resolved*, That the thanks of the Wisconsin Horticultural Society are tendered to His Excellency, Governor Rusk, and to the Superintendent of

Public Property, for rooms appropriated and courtesies enjoyed at this convention.

*Resolved*, That the thanks of the Wisconsin State Horticultural Society are tendered to the railroads for reduced rates.

*Resolved*, That the president be authorized to send such delegates to kindred societies, during the coming year, as in his judgment he thinks best.

Mr. Tuttle reported his attendance on the meeting of the Minnesota State Society.

On motion of Mr. Kellogg, the expenses of members attending the coming summer meeting were ordered paid, in case the finances of the society should allow.

The following resolution, introduced by Mr. Kellogg, was adopted:

*Resolved*, That we hold our annual meeting as horticulturists on Monday, Tuesday and Wednesday, and any joint convention thereafter, and that a programme be prepared and published.

The society adjourned to 9 A. M., on Friday, at 10 P. M.

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CAPITOL, February 6, 1885.

The society met at 9:30 A. M., President Smith in the chair.

The subject of blackberry culture being called up for discussion, it was said that about Ripon the Ancient Briton was made very profitable by employing light winter protection. Mr. Stone, of Fort Atkinson, said that, in that section of the state, Stone's Hardy and Snyder were the main reliance. Protection in winter was not resorted to generally, but the speaker was becoming convinced of the desirability of light protection even for those varieties considered hardy without it. The plants are merely bent down after loosening the soil a little with a spading fork on the side to which the stool of plants is to be bent and the latter is gently pushed over. Then a few forksfull of dirt are thrown over the branches to hold the plant in place, the main reliance for protection being placed on the snow that falls in sufficient quantity to cover the plants that have been bent. Plants protected in this manner mature their fruit three to six days earlier than others beside them left unprotected. Eight acres of 1-year old bushes were laid by two

men in three days' work. Full-grown bushes require double the labor.

With protection one hundred bushels of fruit per acre was considered a good average crop by Mr. Stone. More might be obtained; less was unprofitable.

On the question of varieties, the speaker said that the Ancient Briton was a larger, more attractive berry than either of the others named, but it was no more productive nor of better quality than either of them in his experience. Customers who had been accustomed to Stone's Hardy and Snyder, preferred them to the Ancient Briton for table use, notwithstanding the superior size and appearance of the latter.

Mr. Harris stated that in Minnesota some berry growers protect their plants in the manner described by Mr. Stone. Occasionally a cane is broken, especially in the case of the Snyder, which has more brittle wood than other varieties. The Ancient Briton proves satisfactory in Minnesota, provided the fruit is left on the vine until fully ripe.

Hon. B. F. Adams said that where the mercury seldom goes below  $-30^{\circ}$  F., winter protection is scarcely necessary for the Snyder or Stone's Hardy blackberries. On clay soil there is so large a breakage that he does not resort to it. In the severe winters preceding, a few buds have been winter-killed, and the yield has been lessened. After a mild winter the crop is often very large, about Madison; after severe winters, one hundred to one hundred and twenty-five bushels per acre is an average yield. The plants prove more susceptible to a moderate degree of cold with a high wind than to a lower temperature without high wind. The speaker felt hopeful that new varieties perfectly adapted to the climate of Wisconsin and of first quality as to fruit could be obtained in the course of a few years, from our wild vines by cultivation and selection.

President Smith suggested that the hardiness of wild plants—blackberry, raspberry and strawberry—might be in part due to the protected situations that they naturally affect; but Mr. Adams said that new plants of seedlings now being tested on his place were placed under the most un-

favorable conditions to kill out all but the strongest, which prove very hardy.

Mr. Floyd plows the ground on both sides of the rows of his plants, which he bends in the furrows for protection. Two days' labor suffices to lay an acre of plants. The furrows made are four to five inches deep. The plants are set in rows eight to nine feet apart in his neighborhood. The bushes are pinched off at the height of three feet; three to five canes being left to a hill and induced to vigorous branching by the pinching off of the canes. Mr. Floyd's berries are grown on light soil, easily worked.

Mr. Stickney said that every fruit-grower should be cautioned against setting blackberries on rich soil, or on clay soil. Too rich soil stimulates growth so late in the season that winter killing is inevitable. The poorest, lightest soil on the place is adapted to the most successful growth of the fruit. The strong point of Stone's Hardy was stated to be its early maturing of wood on soils adapted to blackberry culture.

According to Mr. Stone, the only failures of Stone's Hardy reported to him were due to efforts to stimulate the plants on rich soil.

In Mr. Adams's experience manuring was profitable even for blackberries.

Mr. Stone said further, that while he believed poor soil better adapted to the growth of the fruit than rich soil, he would not discourage anybody from moderate manuring, providing the plants were given winter protection, which was then more necessary. Bearing might be stimulated by this treatment.

Mr. Adams rigidly pinches back the main canes and branches until the first or middle of August, when the wood left will be pretty certain to ripen. The canes so treated ripen perfectly, even on rich land. Raspberries are given the same treatment.

In reply to a question, Mr. Frank Phoenix, of Delavan, said that the Marlboro raspberry had been fruited by him on one plant. In thirty days from planting this gave one hundred berries, but the hardiness of the variety was still to be tested.

The fruit, while large and well formed, was not otherwise superior to other varieties. In color it lies between the Shaffer and Crimson Beauty.

President Smith remarked on the diversity of opinion on the flavor and quality of the fruit of this variety, which Mr. Phoenix thought might possibly result from the age of the plant bearing it.

Mr. Hazeltine asked how the currant slug could safely be kept under, as customers object to fruit on which hellebore has been used.

Mr. Smith and others said that white hellebore is safe and sure in its action.

Mr. Adams spoke of dusting with flour of sulphur as a successful means of keeping these sawfly larvæ down.

Mr. Stone used a hot solution of alum, which is sprinkled on by a watering pot.

Mr. Trelease said that land plaster, ashes or even road dust, sprinkled on the plants in season was found almost as satisfactory as hellebore, but the latter was perfectly safe if applied so as not to be inhaled, as it was removed by rains before the fruit was ripe.

Mr. Harris spoke briefly of a native plum, the "Rolling Stone," introduced by Mr. O. M. Lord, of Minnesota City, which he said was very promising, the fruit keeping nine days after picking, while the skin is loose, peeling as easily as that of a tomato for table use or canning. The canned fruit has something of the flavor of prunes. The original tree, which has been in bearing for upward of twenty years, is still in good condition and bears well; cultivated trees bear equally well and produce fruit but a little smaller than the De Soto, which this variety nearly equals in productiveness. The quality of the fruit referred to made this a very promising variety.

In reply to a question by Mr. Harris, Mr. Trelease referred to a paper in volume 2, of the proceedings of the Mississippi Valley Horticultural Society, as giving a resume of what is known of the grape-rot in the United States.

On motion, the secretary was authorized to pay the ex-

penses of entertaining the Minnesota delegates to the convention.

The usual resolution was passed, making ladies who had contributed papers to the joint convention, on invitation of the Horticultural Society, honorary annual members.]

The Society adjourned *sine die* at 11 A. M.

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## REPORTS OF LOCAL SOCIETIES.

### FREMONT HORTICULTURAL SOCIETY.

SATURDAY, January 5, 1884.

The society met at the house of the president, in Fremont, for the election of officers, and the discussion of questions connected with horticulture. The meeting was called to order by President Eaton.

The following officers were chosen for the ensuing year: President, C. F. Eaton; vice-president, Henry Spindler; secretary, J. Wakefield; treasurer, Jacob Steiger.

Executive Committee — J. M. Brown, T. P. Looker, W. A. Springer.

C. F. Eaton, delegate to the convention of the state society, recently held at Green Bay, and W. A. Springer, delegate from the county society, were called on for reports of that meeting, and stated that Waupaca county took the first premium on fruit, and still didn't try very hard. It had on exhibition about 200 plates of apples, over 150 of which were from Fremont. The exhibitors were E. W. Wrightman, A. S. Bennett, C. M. Fenelon, W. Masters, Mr. Wilson, of Weyauwega, Hollis Gibson, Mr. MaWhinney, of Lind, W. A. Springer, M. Riley, J. Billington, J. M. Hickman, of Fremont.

They had one of the best times they ever enjoyed, a pleasant trip, first-class entertainment, and fully believe that the Green Bay people are among the most hospitable to be found on the western continent.

After partaking of an excellent repast, furnished by our  
8—H.



host and hostess, the society adjourned, the next meeting to be called by the committee sometime during strawberry season.

J. WAKEFIELD.

*Secretary.*

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GRAND CHUTE HORTICULTURAL SOCIETY.

This society has been in successful operation since 1871. At that time and for several years after, the meetings were held annually and semi-annually. In 1879 the constitution was revised and a resolution passed that four meetings should be held each year. Since then, the society has met regularly in April, July, October, and January, every year. The topics discussed have been those pertaining to the seasons. The past year the meetings have been more pleasant than at any former time; the attendance large, the membership increasing, and the exhibition of plants, flowers and fruit has been uniformly good. The year just closed has been one of great abundance in every department of horticulture, and the bountiful crops now in store are a constant incentive to greater effort the coming spring. The members manifest an increasing interest in fruit and flower culture. One, who is engaged in market gardening, has added a fine greenhouse to his grounds the past season. Many will set some of the new and choice fruits and flowers in the spring. Volumes of Transactions are distributed each year and are much perused by the society. The annual meeting was held January 17th. The election of officers resulted in the choice of L. L. Randall, president; Mrs. D. Huntley, secretary; A. H. Burch, treasurer. This meeting was appointed at 10 o'clock A. M. The morning was spent in conversation. After dinner the time was devoted to reading and a discussion of the newer varieties of grapes and apples. Many members were present with their entire families, and all returned home with high hopes that the coming season will witness greater effort and larger success in horticulture than we have ever known.

MRS. D. HUNTLEY, *Secretary.*

## GREEN LAKE COUNTY HORTICULTURAL SOCIETY.

The adjourned annual meeting of the Markesan Horticultural Society was held February 16, 1885. The weather being bad, and sickness in some of the families, there was not as large an attendance as there otherwise would have been. The display of fruits and flowers, considering the time of the year, was very good.

The officers of last year were all re-elected, as follows:

President—Miss Fannie L. Mather.

Vice-President—Mr. Chas. Lambert.

Treasurer—Mrs. C. S. Whittier.

Secretary—Miss E. J. Whittier.

After due consideration the name of the society was changed from the Markesan Horticultural Society to Green Lake County Horticultural Society.

The meetings we have held have proved to be instructive as well as entertaining, bringing forth thought, study and new ideas that would have remained dormant had it not been for the suggesting influence of the meetings.

The transactions of the State Horticultural Society for 1883 and 1884 were received, distributed and highly appreciated.

E. J. WHITTIER, *Secretary*.

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## REPORT OF JANESVILLE HORTICULTURAL SOCIETY.

The report of this society is but little change from former ones. No new members have been added during the year, but the old ones keep their shoulders to the wheel and we still keep on.

Several meetings have been held with pleasure to all present.

The annual meeting was held December 4, 1884 and officers elected for the ensuing year, as follows:

President—Geo. J. Kellogg.

Vice-president—B. Spencer.

Secretary—E. B. Heimstreet.

Treasurer — J. B. Whitney.

Trustees — J. J. R. Pease, D. E. Fifield, Jas. Helms, A. S. Wickham, O. P. Robinson.

Geo. J. Kellogg elected delegate to State Society, 1885.

Geo. J. Kellogg and wife elected delegates to Mississippi Valley Association at New Orleans.

Treasurer reported all bills paid and a balance of one hundred dollars (\$100) in the treasury.

Respectfully,

E. B. HEIMSTREET,

*Secretary.*

January 8, 1885.

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NORTHWESTERN HORTICULTURAL SOCIETY.

The annual meeting of the Northwestern Horticultural Society was held in the court house, in La Crosse, December 9, 1884. The attendance of members was small and the attendance of spectators was moderate also, but a good deal of genuine interest was manifested by those present. President Harris made a report of his labors as a delegate to the state society, last February, which was satisfactory.

The rules of the American Pomological Society were read and referred to the executive committee of the society for adoption or revision, report to be made by publication in the daily papers. Very little other business was accomplished during the morning.

The afternoon session opened with a paper from Mr. E. Wilcox, on "Apple Growing of the Past and Present," that was well received.

Mr. Kramer, of La Crescent, reported the discovery of a new raspberry seedling.

The election of officers for the ensuing year then occurred, with the following result:

President — John A. Harris, La Crescent.

Vice-President — E. Wilcox, La Crosse.

Second-Vice President — John F. Hosmer, Shelby.

Third Vice-President — Mrs. Ida M. Tilson, Hamilton.

Secretary — John Van Loon, Holland.

Treasurer — Mrs. W. P. Powers, La Crosse.

The officers are members *ex-officio* of the executive committee. Three other members were elected as follows: John A. Salzer and R. Calvert, La Crosse; E. Markle, Shelby.

Messrs. Hosmer, Van Loon, George Gable and Mrs. Wilcox reported on the fruit exhibit, which was not large but contained some fine specimens. Mr. Wilcox exhibited seventeen varieties of apples, George Gable thirteen. John C. Kramer showed six seedlings, and a plate of Tallman Sweet. John Turnbull, a winter seedling, sweet, and a specimen called the "Plum Cider." Mrs. Hosmer and Mrs. Markle exhibited some fine canned fruits.

Mr. Salzer presented a paper on house plants.

Mr. Markle discussed strawberries somewhat, saying he had a good crop last season and that plants were in good condition at the beginning of winter. He then branched off into the apple question, and complained that La Crosse had not a market place and a canning establishment to furnish a market for the apple crop.

This provoked discussion, and the members generally seemed inclined to lay the fault of not having a better market here entirely to La Crosse; when Mr. Calvert suggested that there was an opportunity for the members to show their faith by taking stock in a canning establishment themselves, before demanding that others should invest.

Mr. Salzer, Mr. Calvert and Mr. Hosmer stated they were ready to take stock.

Mr. Van Loon spoke very discouragingly of apple raising for profit, though he admitted that his Duchess apples had paid him.

Those best posted said they sold Duchess apples early, when they were green, and that they were readily and profitably marketed then.

Mr. Harris said he made more out of his apples than can be made out of ordinary farm products. He thought this country should supply the west and that eventually there would be a good market there. The manufacture of cider and vinegar was suggested as a means of using apples.

Plums were discussed at some length and those who had

best luck seemed to be those who kept poultry and allowed them to run among the trees. Cultivation and fertilizing were considered necessary by some. The Cheney plum, a wild variety found in Vernon county some years ago, now raised by Mr. Markle and Mr. Hosmer, was shown. It is as large as a medium peach and a very fine fruit.

The president appointed the following committee on observation who are to present papers at the next annual meeting:

Strawberries — J. M. Gray, Trempealeau, and E. Markle, Shelby.

Apples — E. Wilcox, La Crosse, A. J. Philips, Hamilton, Geo. Gable and J. F. Hosmer, Shelby.

General small fruits — J. F. Hosmer.

Grapes — John C. Kramer, La Crescent.

Market gardening — John Van Loon, Holland.

Flowers — Mrs. Dr. Laffin, La Crosse, Mrs. Ida M. Tilson, Hamilton.

Canning fruits — Mrs. J. M. Barclay, La Crosse.

Insects — Dr. J. Renggley.

On motion of Mr. Wilcox, Mr. John S. Harris was elected an honorary member for life. Mr. Harris acknowledged the compliment in a few words.

The next meeting of the society is to be held on the first Tuesday in March, and Messrs. Harris, Markle and Van Loon, and Mesdames Tilson and Laffin have been requested to prepare papers upon subjects in which they are interested.

JOHN VAN LOON,  
*Secretary.*

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#### WAUPACA COUNTY HORTICULTURAL SOCIETY.

During the past year the meetings of our society have been pretty well attended. Our winter meeting was held in Weyauwega, January 25, 1884, at which our officers were chosen.

W. A. Springer, delegate to the Green Bay meeting in December, gave a verbal report of that meeting. He read

a list of premiums received by Waupaca county, fully maintaining our reputation as a first class fruit-raising county.

The following is a list of officers the present term :

President — Alvin S. Bennett, Royaltown.

Vice-president — G. W. Taggart, Weyauwega.

Secretary — J. Wakefield, Fremont.

Treasurer — J. A. Mathews, Weyauwega.

Ex. committee — W. A. Springer, chairman; W. Willrow, C. F. Eaton.

Delegate to state society — W. A. Springer.

Our fall meeting was held at the house of I. C. Alden, and well attended by the members and families, resulting in our usual picnic.

We had a fine display of apples, mostly our county seedlings, and we were not ashamed of them. Of course, some of them must disappoint us, it cannot be otherwise. But take them all together we challenge the whole Badger state to find another county that can produce more, finer looking, better flavored, and hardier seedling apples than ours.

At our fall meeting the subject of tree blight was discussed, with the usual result, no one being any wiser for it.

Our exhibition of grapes was poor; in fact, it amounted to nothing; but it was not our fault. Many grapes the past season failed of having a single perfect berry, but the vines appear all right for another year.

We have about fifty members, the majority being *working* members. We were very much disappointed in the small number of reports that were doled out to us by the state. If our state is forced to be "economical" until economy borders on parsimony, let some other expenditures be criticised a little, and do not go so sharp for the poor crab apple raisers!

J. WAKEFIELD,

*Secretary.*

## REPORTS OF COMMITTEE OF OBSERVATION.

## FIRST DISTRICT — GEO. J. KELLOGG, JANESVILLE.

As I find no report from our district for 1883, I will briefly go over the ground; and to better understand the association of the changing winters, I will give a synopsis of the weather.

The winter of 1880-1 gave 52 days when the thermometer was at zero and below, aggregating..... 606°  
 1881-82, only 11 days below, aggregating..... 61°  
 1882-83, 47 days below, aggregating..... 597°  
 1883-84, 33 days below, aggregating..... 371°  
 1884-85, (to Feb'y 12) 37 days below, aggregating..... 459°

Thus it will be seen that of the past five winters, four have been excessively cold and one the mildest (excepting the mud blockade of 1877-8) for 25 years.

The season opened with the appearance of the robin March 1st. April 7th commencement spring's work. April 25th ice; also May 22d and 23d. May 16th the first strawberry bloom. June 16th first ripe Crescent and Wilson strawberries.

The season gave a fair crop of strawberries and Turner and Brandywine red raspberries; also of Gregg, Souhegan, and Onondaga black raspberries. The Cuthbert red raspberries were so badly injured that they gave but little fruit.

Owing to the excessively hard winters of 1880, 81-82 and 1882-83, the orchards all over our state began to surrender; some of our old and tried varieties, which we considered iron clad, went down in the grand smash.

We find nothing left that is strictly iron clad as to winter. Golden Russet and Willow Twig come nearest this of anything. A few others on our list may do for timber ridges, lake shore regions and the mountains of Baraboo, but for the general farm location we have nothing left that is perfectly reliable, after you name the bitter crabs and Duchess of Oldenburg, Fameuse and Wealthy,—not a winter kind to tie to. The tree fruits of 1883 were very light and badly injured by the curculios and gougers.

Grape vines that were properly cared for set a heavy crop of fruit, but the frost of September 7th, 8th and 9th ruined the entire crop.

Blackberries that were covered gave a very fine crop of fruit and brought good prices. The latest kinds were caught in the frost of September and did not mature the late fruit. Blackberries that were not protected gave but very light crops if any fruit at all — even Snyder and Stone's Hardy were killed to the snow line. Winter set in November 14th, but the plows ran some up to December 14th. The winter show of fruit at Green Bay was the most cheering sight of the season, showing more than ever the adaptation of soils to fruits. Elevation and lake protection for success in horticulture!

As might be expected, the season of 1884 only revealed the combined efforts of two hard winters, and the clearing from nearly all our orchards of a large proportion of our old standards.

Spring opened with the appearance of the robins and wild geese, March 17th. Dug a few plants the 22d, and commenced spring work March 29th. Snow April 7, 8, 9 and 20. 21st, ice one-half inch, and ice the 16th and 29th of May, killing from one-fourth to one-half of the strawberries, and all grapes, except in favored and high locations. Raspberries did not suffer as badly as the winter of 1882 and 1883, and Cuthbert gave a fair crop; but blackberries, unprotected in some places, did not give fruit enough to pay for the picking. September was cool and the first week in October exceedingly hot. Ice October 9, 23, 24 and 25, and winter set in November 23d.

What few apple trees had survived the last four hard winters did their best, and in some sections apples were very plenty, showing more than ever the necessity of adaptation to soil, and the value of elevations and lake protection — our lake shore region producing very fine R. I. Greenings, Jonathans, Baldwins, etc., which sold at one dollar per barrel direct from the orchard, *nice, selected*, hand picked fruit.

The finest fruit in this district was grown in Walworth,



Kenosha and Racine counties, on the clay and timber ridges, and the finest fruit in our state was from the Baraboo hills, Green Lake and Waupaca counties. We readily see why Baraboo succeeds so well, but why Green Lake county should grow such nice Grime's Golden, Blue Pearmain, etc., is beyond our horticultural arithmetic. We can understand why Kenosha county can grow Greenings, but cannot account for the success of apples in Waupaca county.

Year after year we find mildew, blight and insect depredations more and more prevalent. I am convinced that in my district one-half of the apples, cherries and plums have been injured by the curculio, gouger, and codling moth. Many of you are familiar with the failure of Stickney's five hundred Duchess, which ought to have given 2,500 bushels of choice fruit, and he got just twenty. The soil and high culture may have something to do with the failure, but I think nine-tenths of the failures are caused by the apple gouger, and I consider him the worst insect we have to contend with. From experience and observation I am satisfied he cannot be reached by poison; that stock feeding, hand picking and the jarring process are our only remedies. The members will pardon me for rambling outside of my district, but this insect pest with all others must be met, and I know of no way unless we experiment and report. New York and Iowa both claim they can be reached by poison. I have tried poison for two years, came near killing a man, but don't know of a gouger that I hurt.

FIFTH DISTRICT—E. W. DANIELS, AURORAVILLE.

So far as I am able to learn, the number of fruit trees planted last year is smaller than that formerly planted, but the varieties are more carefully selected. Some people are learning swindlers.

The effect of the climate on fruit trees has been less severe for the past two years, with the exception of continued damage by summer winds in time of fruiting. Ten years ago the cold killed the oaks on the "openings" near here. Last week the mercury went to about 40° below zero, but I have not looked for the effect on fruit.

Apple orchards were less troubled by insects last year than for several years, if, indeed, they have ever been so exempt. There were no caterpillars except the late leaf-rollers, which we usually have. The caterpillars on my black walnut were less numerous than they have been since I first noticed them, four or five years ago. Codling-moths and apple-worms were few, and there were few, if any black scabs on the Fameuse and other varieties usually affected. Rabbits were also less troublesome than usual.

Wood growth on the apple was a third greater than usual. I have a cion of the Northwestern Greening, four feet long. Top grafting is growing in favor with me. In 1879 I put top grafts into thirty crab trees. In 1883 some of them bore a half bushel of dwarfish apples apiece, but in 1884 many of them yielded a bushel each of such varieties as the Northwestern Greening, Pewaukee, Wolf River and Duchess. These grafts are all united perfectly. A few of the Pewaukees died at the top but the others are all healthy and full of fruit spurs.

Small-fruit culture is on the increase, while the quality of the fruit is being improved.

Apples are abundant in Green Lake county, and not scarce in Winnebago county and the east half of Waushara county. Shipments from Ripon, as I learn, were 3,400 barrels, and 1,200 were shipped from the town of Aurora, in Waushara county.

I am not acquainted with Marquette county, but have received the following letter from Mr. Borst, of Princeton:

PRINCETON, WIS., December 13th, 1884.

FRIEND DANIELS, Auroraville, Wis.:

*Dear Sir:*—In replying to your inquiry of the 11th inst., will say that in the west part of Green Lake county there are quite a number of old orchards in very fair condition. Many new ones are quite promising. The cultivation of small fruit seems to be limited to the home demand. Of Marquette county, I must say that the south half of the county seems well adapted to apples as the growing orchards testify. The north half being composed of lighter soil the

trees die out much more than south of Buffalo lake. And yet the people in the north are trying hard to have orchards. In the vicinity of Westfield there are some very fine ones. Mr. Lyman Cook, just north of the village of Packwaukee, has an orchard of two or three thousand trees, and he is determined to keep his orchard up by filling in the place of dead trees with new ones of hardy varieties. Marquette county fairs show that that county is alive and progressive in fruit growing. As fine specimens of apples are exhibited at their fairs as at any which I attended. Small fruits are only raised in small patches.

Taking the territory of which you inquire as a whole, I must say that the people are making fair progress in horticulture. Any further information will be freely given at any time.

Yours very truly,

J. O. BORST.

EIGHTH DISTRICT — E. G. PARTRIDGE, ROBERTS.

The district assigned me is so extensive that I have neither been able to visit nor obtain accurate information in regard to a large part of the same. My own observations have been confined to the valley of the St. Croix. Throughout this valley but little attention is given to apples at present. Repeated failures have so discouraged most experimenters in this direction that they have either abandoned the effort entirely or have excluded from their orchards all but the hardiest of the Siberians—mostly the Transcendent and the Hyslop. The Duchess was planted quite extensively a few years ago, and many of the trees lived to bear several crops, but they have nearly all gradually succumbed, and as a rule, have not been replaced, except by the varieties above mentioned. A few Wealthy and Whitney's No. 20 have been set, but neither is quite hardy. The latter will generally succeed in favorable localities. Our main dependence for the future orchard must be upon seedlings raised here, or upon the newer Russian varieties introduced by Professor Budd.

As to small fruits—raspberries and blackberries so abound in the forest region of this valley, that but few think it

worth while to attempt their cultivation. The Blackcaps are not hardy here. Turner and Philadelphia are cultivated to some extent. The Turner, in my judgment, is the most reliable. The Snyder blackberry has been tested to a limited extent, but is not safe without winter protection.

The cultivation of strawberries for home use and near market has received considerable attention, and is reasonably successful. Crescent and Wilson are the most popular varieties, though the latter is apt to winter-kill unless carefully protected.

Grapes are grown to a very limited extent, though in many localities they might be made, with careful winter protection, a sure and profitable crop. Mr. Nichols, of Prescott, planted two or three acres of Concords and Delawares a few years ago and realized handsome returns from the same, but I am informed that this vineyard has of late been neglected and is no longer productive.

The present winter has been the most severe ever known in this region. Four times the temperature has fallen below  $-40^{\circ}$ ; once, January second, to  $-48^{\circ}$ . Whatever tree or shrub comes out alive next spring may be considered truly "iron-clad."



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PROCEEDINGS OF THE SOCIETY

AT ITS

MEETINGS IN 1884--5.

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## In Memoriam.

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Mrs. Charlotte E. Lewis, late secretary of the Wisconsin State Horticultural Society, died at her home in Madison, August 16th, 1884. She was born in Carbondale, Pa., November 23d, 1834, and was the only daughter of Addison W., and Cynthia Clark. In her childhood, her parents removed to Battle Creek, Michigan, where she was educated in the public schools and a female seminary there located. Two years after the death of her father in 1852, the family removed to Madison, Wis. In 1858, she married the Hon. Henry M. Lewis of this city. During a period of nearly twenty-six years no happier home could be found in this community. Their children numbered three, Lottie Breeze, Jessie R., and Sophia M. Lottie, the eldest, died nearly two years ago.

For thirty years a resident of Madison, Mrs. Lewis became widely known and highly esteemed in social circles; she was alway active in deeds of benevolence and kindness, zealous in literary and horticultural pursuits, and was an ardent admirer and student of nature's works. She early became an active worker in the Madison Horticultural Society, which, during the flourishing period of its existence from 1858 to 1873, did so much, not only in beautifying the city, but in awakening a more general interest in horticulture in the surrounding country. This society held forty-one public exhibitions of fruit and flowers, in nearly all of which Mrs. Lewis was a prominent exhibitor, and generally obtained first premiums on her exhibits. Being a ready writer on themes which she relished, she contributed many useful and interesting articles relating to horticulture, which are published in the volumes of transactions of the State Horti-

cultural and Agricultural Societies; and in the winter of 1882 she accompanied the Wisconsin delegates to the Mississippi Valley Horticultural Society meeting at New Orleans, and there read a paper on "Birds in Horticulture," published in Vol. I, of that society's transactions. She has also read several interesting papers before the Madison Literary Club, of which she was a member, and for a while secretary. She was also a member of the Wisconsin Author's Club, a contributor to the *Western Farmer*; and one year she had charge of the Home Department of that paper.

At the last annual meeting of the State Horticultural Society she was unanimously elected its secretary, and engaged in the duties of the office with the zeal and energy that characterized all her public efforts. Under her supervision the volume of transactions for 1884 had been completed and the first copies received from the press for distribution by her, among the members of the society, and while her attention was busily engrossed with various enterprises—organizing a branch of "The Flower Mission" in Madison, preparing for the state fair, and laboring with her pen to awaken an interest among horticulturists in the New Orleans Exposition—suddenly, in the zenith of her useful life, death closed her career.

We will not speak of the sorrow that so unexpectedly darkened the home she had so long made bright and serene with her presence. A sympathizing community mourned; friends and neighbors evinced the keenest grief as they looked for the last time on her familiar features, so beautifully expressive of kindness even in the cold serenity of death. Forest Hill Cemetery, overlooking the city and Mendota and Monona's waters, now holds the mortal remains of our friend; and its native grove-crowned heights, verdure-skirted walks and ornamental shrubbery are in fitting harmony with her own ideas of nature's beauties and the noble art she loved.

Her life, in which many had an interest, furnished material for profitable reflection. With the cares of a family to which she was fondly devoted, she found time for mental culture, allied herself to various associations, and worked in




them with persevering industry, striving to infuse into others the spirit and zeal requisite to achieve success in undertakings. Generous to a fault, she lavished hospitality with a most liberal hand and won steadfast friends among the many who knew her. She was endowed with ambition which, governed by excellent qualities of mind and heart, drew much of its inspiration from contemplating the beauties and mysteries of nature's works; it also engaged her in deeds that benefit mankind; it enlivened and instructed social circles of culture and refinement with kindly regard for all; it disarmed envy; it shone with soft and mellow light by the bedside of the sick and dying and touched tenderly the heart chords of the inmates of hospitals and asylums, and waked them into hopeful life. Her career, so strongly marked by genial and benign influence, when ended still leaves a radiant light that gleams

"Like twilight hues when the bright sun has set."

In this radiance the members of the Wisconsin State Horticultural Society will, as time passes, cherish and honor her memory.

J. M. SMITH,  
B. F. ADAMS,  
WM. TRELEASE,  
*Committee.*



## PAPERS READ AT THE MEETINGS OF THE SOCIETY.

## SUCCESS.

BY MRS. A. A. ARNOLD, GALESVILLE.

"It will not do to give yourself to be melted down for the benefit of the tallow trade. You must know where to find yourself."—*George Eliot.*

This may seem a homely assertion, yet there is much of truth in it, much of importance to us as fathers and mothers, as brothers and sisters.

It does not mean that we must not be unselfish and generous, manly and noble; yet much of our happiness, much of our success in life, depends upon true independence of character, upon assertion of self.

When we pass in review the early history of the American people, we find that though poor, financially, they were rich in men and women of rare intelligence and those sterling qualities so essential to the success of any government, and especially a republic. They were of the type that self-denials and privations could not dwarf. They made the opportunity to relieve their children of the bondage that was bearing them down. In those days the opportunity to perform a kind or noble act was considered a providential indication of duty, and the best discipline of life was in promptly seizing such opportunities. We can but rejoice in what their patriotism has gained, and it would be well for us to act more readily from such pure motives.

'Tis the ultimate object of education to enable us to act well our part, to think for ourselves, to be men and women in mind as well as in stature. We seek knowledge as a means to an end. We mean not merely a knowledge of books, but of men and things, with an aptness in making it available in whatever pursuit we follow. Few can afford to be simply men of letters, therefore it should be thorough and practical to successfully fit its recipient for the struggle

of life. It should teach us to observe, to use our success and in a measure our imagination, give us at a glance an insight into the "situation." In Mrs. Stowe's biographies of eminent men, we notice their advantages were varied. Salmon P. Chase having finished his college course, and being given a spade by his uncle, understood fully what it meant. He did not look lovingly at his soft white hands and cast it aside. The world was before him, he had work to do. The discipline enabled him to improve his opportunities, and he proved of sterling worth as chief justice and secretary of the treasury.

Henry Wilson served an apprenticeship of eleven years on a farm. He applied himself "to reading by fire-light, by twilight and on Sundays," till he was familiar with history, geography, biography and general literature, thereby storing his mind with a knowledge of incalculable value, as his public career of usefulness testifies. In these two illustrations the advantages differ, yet very nearly the same results were obtained.

There are none of our farmer boys that can not read as did Henry Wilson if they will; and if you cannot have the advantage of school life you may know more of the world and the practical, and this is no small thing to learn. Earnest endeavor and intense application are certain to bring rich reward. Some seem to rise to distinction through no merit of their own, but by a combination of circumstances.

To-day, as public sentiment is, 'tis easy to see that had Mr. Cleveland's life been pure, or had Mr. Blaine's public record not been questioned, either one would have been elected to the presidency by a large majority. When young we are sometimes reckless of what we do, forgetting that when we are old we live in the past, and that bad deeds, missteps, are dark blots upon our lives that we then have time to bitterly regret.

"How long we live, not years but actions tell,  
That man lives twice who lives the first life well."

Could we walk steadily onward 'til we reach the standard we covet, not take excursionary skips and hops upward, then

as regularly flounder and flop down again, we would retain at least our self respect.

We must not expect to attain perfection in all directions, without meeting discouragements. Commodore Vanderbilt said, "there's no secret for success in life; all you have to do is to attend to your business, and go ahead,—except one thing, never tell what you are going to do till you have done it."

Let me ask you young gentlemen, do you know where to find yourselves? I'm not surprised that many of you think you know exactly what is best for you, without the advice of parents or friends; but with a few more years of experience you will ask with all sincerity, and an honest desire to make the most of your manhood, what vocation you are best fitted for naturally, and consequently which you can be the most successful in.

Catechise yourself severely as to motives and fitness. Having finally decided, fight your way through all obstacles. Do not be alarmed if duties and uncontrollable circumstances seem to hedge your path; become familiar with the most trifling details; gain information from all sources possible that have any bearing upon your chosen avocation, for only in this way can you hope to be master of your business.

The extremes of certainty and uncertainty are very great, and you will often feel quite at a loss to know just what will be to your advantage. If you are fresh from college, we hope you know that true learning makes a man humble and modest, and that your education is but the stepping stone to further development. Let the basis of your every action be a principle of right, being right, doing right. Never think that a good end can possibly justify bad means. What is bad is bad, let it result as it will, and what is good is good, whether it leads to the gallows or a throne.

Ever do then what is right, ever say what is right and true, and you need trouble yourselves little about consequences. The want of principle causes many failures, its presence creates confidence in those we have to deal with. In a word, whatever convenience may be thought to be in falsehood and dissimulation, is soon over; but the inconvenience of it is perpetual, because it brings a man under

an everlasting jealousy and suspicion, so that he is not believed when he speaks the truth, nor trusted when perhaps he means honestly. When a man has once forfeited the reputation of his integrity he is fast, and nothing then will serve his turn, neither truth nor falsehood. "We can not retain for any length of time the confidence of our fellows without deserving it, nor win laurels without earning them, nor enjoy respect without meriting it."

You must feel responsible for you doings, for in this way you learn foresight, patience, self-control; could you get everything you want by the simple asking, you would be but a moral weakling; 'tis vastly better for you that you are obliged to study and labor, and wait—work out your own fortune.

When divested of this responsibility you are deprived of the greater part of your usefulness, you are but a machine, into whom God has breathed the breath of life and given brains and sympathy.

So find out what you want to be and do, feel that the world wants you and your works. As Mr. Burdette expresses it "take off your coat and make success in the world. Don't be afraid of killing yourself with over work; 'tis rarely done on the sunny side of thirty. They die sometimes, but it is because they quit work at 6 P. M., and don't get home until 2 A. M." Habits of industry are a great safeguard against temptation. Courage and work invigorate the whole system and lift one into a purer atmosphere; the most earnest workers talk little about the exhausting labors of their profession.

The busier you are, and the less liable to fall into the hands of him who employs the idle, the better satisfied will the world be with you.

The fireside department of our agricultural newspapers is for the exchange of ideas upon familiar subjects, but I fancy the editors chuckle in their sleeves at many of the common-place contributions, and must have a poor opinion of the literary taste of their readers if they suppose that such themes will satisfy their cravings for information. We can become familiar with a phase of human nature by

their perusal, yet the general reader will not be sympathetic enough to appreciate their trials; will not care whether Dolly V. wears a Mother Hubbard or a Jersey, whether they choose to live on gruel or good, substantial food, or whether they think it right to dance or paint their faces. Many of these correspondents could receive suitable advice from almost any of the good, womanly mothers of the neighborhood, and not be obliged to inflict the newspapers. We appreciate the impulse that prompts the inquiries, but question the ability of the writers and the appropriateness of making them so public. Others complain of miserly fathers, saying they haven't a penny to call their own, with which to cultivate their taste or beautify their homes, though, automaton-like, they move from morning till night for the general benefit. Such instances are getting less frequent where a father carries out the patriarchal idea so completely. If this niggardliness has grown with the years and neither love nor pride can change him, you are indeed unfortunate. True economies are worthy of all praise, but when the spirit is avarice, dwarfing those that should be near and dear, we have no patience with it.

This unrest signifies better times. If you were content you would scarcely exert yourselves in the direction needful for a change. If you are so modest as never to have an opinion of your own, why some will think for you perhaps to your disadvantage. The other extreme would make one notorious in the neighborhood.

Whatever of education or advantage is given the young man, as rightfully belongs to the young woman, and every day proves more fully that she can fill positions of responsibility with credit. We have often heard it argued that young women will never make as good clerks or secretaries as men, that they only resort to it for a time while waiting for a husband. I have heard it stated by those who ought to know, that they are more contented, more cheerful, less restless, more to be depended upon, and less likely to become rivals in the business of their employers. It is expected that the young men will do business for themselves as soon as they are proficient. She is found to be more willing to

do as she is asked, and as for punctuality, endurance and regularity, she has won a reputation in the face of the noisy disputants, who for centuries have argued that nature especially unfitted her for the exacting demands of business life. Give the girls a chance and the more familiar they become with it by being brought in contact with business, the better will they be fitted for its duties.

Our women in journalism are grand successes. In science, there are many of acknowledged worth. Many are notably successful as physicians, with a professional income equaled by but few of the great 'medicine men.' As lecturers, many are popular, worthy of their hire. As artists, we may well feel proud of their work. As lawyers, some are demonstrating that they can succeed, and many assure us that they are meeting with greater courtesy, kindness and business success than they expected.

We know that women have worked in these fields only for a comparatively short period. When our fathers, husbands and sons went from farms, counting houses, and business offices, after the firing of the historic first gun on Sumpter, the American woman's opportunity came, and into the vacant places went mother, wife and daughter, and proved that sufficient unto the day was the strength given.

It will not do to be spiritless and indifferent in what you undertake, if you expect to succeed. The force of habit is "as a cobweb — a thread — a twine — a rope — a cable." If in the right direction your success is assured, for your course through youth will determine your course in maturer years, as regards the energy and push with which you apply yourself. Fortunate are those who have happy homes, and their names are legion, where wife and daughters are blest with the best and purest love of noble manhood. There are many not so fortunate. To those we would say, let the lesson of your youth, the life your mother leads, be a warning to you if you ever think of having a home of your own. If as son or brother, a young man is uniformly considerate of the feelings of his mother and sisters, and if found exercising care for their comfort and pleasure, it is strong evidence

that he will not be forgetful of wife and daughters in the years to come.

It was this thoughtfulness that suggested to Mr. Woodruff the idea of a palace sleeper, that his invalid wife might ride with more ease and comfort. Some of the brightest thoughts of the age owe their creation to the loving desire to cheer the sick room of a suffering wife. Much of the success of the home depends upon the courtesies, acts of love, words of approval and cheer. Might as well try to warm a room with a fireplace and pair of silver plated andirons, and no fuel and fire, as to make a home worthy the name without them.

In a curious paper, entitled, "Advice to the Women and Maidens of London, 1676," we find suggestions so practical for the women and maidens of to-day, that I will quote from it. "Ladies and Gentlewomen—Permit one of yoursex to give you, as far as her small knowledge will reach, some hints to the right understanding and use of accounts—an art so useful for all sorts, sexes and degrees of persons, that next to a stock of money, wares and credit this is the most necessary thing. Nor let us be discouraged in the inspection thereof, by being bid meddle with our distaff. And for telling us that the government of the house appertains to us, and the trades to our father or husband—under favor, the one is to be minded, and the other not neglected; for there is not that danger of a family's overthrow by the sense wanting its right relish, or the tables or stools misplaced, as by a widow's ignorance of her concern as to her estate; and I hope husbands will not oppose this when help and ease is intended to them whilst living, and safety to their name and posterity after death. And let us not fear that we shall want time and opportunity to manage the decencies of our house, for what is an hour in a day, or half a day in a week, to make inspection into that that is to keep me and mine from ruin and poverty. I never found this masculine art harder or more difficult than the effeminate achievements of lace-making, gum work or the like, the attainment whereof need not make us proud, and God forbid that the



practice of an useful virtue should prompt us to a contrary vice."

We can not spend the small portion of time necessary to the right understanding and use of accounts in any better way. Instances have come to my notice frequently of late where, the husband dying, wives and mothers have been left as helpless as their children, and more to be pitied, in utter ignorance of their affairs. When the estate passes into the hands of the executor or administrator, she is wholly at his mercy; being ignorant she is suspicious, and knows not whether it is managed well or badly. How much better for those interested had the wife been familiar with the business of her husband and had no third person been necessary to take charge of his wife's purse.

Whatever tends to make our home life purer and stronger is doing the best and noblest service for society. Society has claims, composed as it is of individuals, of families with mutual interests. The higher the standard of education, of morals, the greater the energy and public spirit of its citizens, the greater their usefulness, as this is commensurate with their thrift and intelligence. We are appreciated and respected for our success. The more fully we work in unison the greater the results obtained. The sooner learned that the man honors his calling, and not the calling the man, the better; and no position is an honor to a man or woman unless they can fill it well. The American people have a respect for official position, but not unfrequently detest the man who holds it.

No institution, no state, will go on of itself and hold its footing in the nature of things while its guardians, or trustees are dozing on their watch. The future success and prosperity of our country depends more upon the character of the men who cultivate her soil, than upon those who shall draw salaries from her treasury. Put intelligence upon the farm, and you will have distinction in the Cabinet. A successful scientific agriculture infuses life and health in the whole body politic, and strengthens the arm of State. By the light of success triumphing over failure, we stagger on toward truth. As Archimedes once boasted, "give me a

place on which to stand and I will move the world." The home is that place of vantage ground, the fulcrum on which to rest any lever of progress. Infuse into the home principles of right and truth, commence there any reform, and you sway the nation.

To realize in actual life a home having an atmosphere of comfort, taste, intelligence, generous impulse, kindly feeling, integrity and moral principles, has been the best effort of the ages; success in this, the measure of progress.

The beauty of successful lives, of trustful, hopeful, free-hearted, charitable lives, is one of surpassing loveliness. Those lives shed their own incomparable fragrance, and the world knows where to find them.

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## THE FARMER'S NECESSITIES.

BY MRS. VIE H. CAMPBELL, EVANSVILLE, WIS.

The necessities of farmers! Ah me! I fear I have undertaken a prodigious task; one requiring herculean efforts, for we, as a class, individually and collectively, are possessed of unnumbered necessities.

Our wants so many, our supplies should not be few.

Now as Necessity is a time-honored parent, we should endeavor to find numerous worthy inventions for a remedy to these ills we farmers are heir to, and, as there are many here to-day representing other branches of industry, if among my suggestions for relief I should say some things that may seem to you as missiles hurled, I crave your forbearance, hoping you will remember that they, like the boomerang, will not fail of returning to the source which gave them impetus.

It has only been a few years since we were considered to have any needs, except plain food, plainer raiment, and the privilege of allowing our girls and boys to attend school a few months, oftener a few weeks, each year, in an uninviting, poorly warmed and poorer ventilated school-house; to advance each term but little farther than the preceding one.

And we, ourselves, have only realized it in a dreamy, half-dazed sort of a way; and where rests the blame? Partly, yes greatly, though not wholly, on ourselves. We should have stepped into our niche and proudly held our position, instead of allowing ourselves to become crowded out by the wide-awake, more ambitious ones, until we farmers have only a "rut" in the highway of life. I think the first remedy should be found at home.

How often do you hear the remark, "Yes, it is a good house, a nice, well-finished house for a farmer"? Now, I could never understand why a farmer should not have just as nice a house, providing always, that his revenue is sufficient, as one who has chosen some other profession — surely not because of its not having been hard earned.

I would have the home — that place which is the training-school in the truest sense of the word, an object of beauty in all its surroundings. We may make it so, and yet do it very inexpensively if we so determine. Nature has dealt with a lavish hand to us who have chosen a rural occupation, giving us hills and dales, and, withal, more than all, space with which to make a beautiful landscape. And here let me plead that our plot for a lawn may not be so limited. Please remember that we are not restricted to fifty or a hundred feet frontage. Remove some of the unsightly old fences that are too near an obstruction to our range of vision. Tear down or move some of the dilapidated old corn cribs. Change the cow yard that is now between the house and barn, to some equally convenient locality, where we in the house shall not be annoyed by the millions of flies that follow in the train of Brindle and Crumple, and let us have the space for a nice, well kept lawn, that shall be "a thing of beauty and a joy forever." Try it brother farmers, and see what an incentive the change created by the small amount of labor you have thus bestowed will prove to stimulate those in the house, who have fewer opportunities than you of getting away from "the smoke of their own chimneys," to feast their eyes on the beauty of the surroundings of perhaps some lovely well-kept place in town.

And now, while at work on the lawn, let me ask that you will cut down or else well trim the the trees that hide the view, and let 'God's glorious sunlight in, chasing away the shadows from our homes as well as our hearts, thereby driving out disease and dampness lurking in the dimness, caused by the brawny branches of those great trees in too close proximity, remembering that trees, like everything else, are only blessings if not indulged to an extreme.

I have in mind, now, a farm home that might be pretty, if it was not completely hidden and darkened by the dense grove of trees that surround it; and every time I pass the place, I wish I had the power to impress upon its owner how beautiful it would be, could he only be persuaded to sacrifice many of those trees, that it might have more the appearance that it had in days of yore, ere they had attained such lofty proportions.

Then I would have the flowers, not in a long row of beds either side of the walk, disfiguring our beautiful lawn, but in some convenient place where they will add to, rather than detract from the surroundings. And, too, the fence—for we must have one, and it is an article of protection, instead of a relic of barbarous nature, as one worthy friend of mine will insist. A hedge is the most beautiful when kept well trimmed, but very unsightly, like all ill-kept things, when not. Then there are the various wire and decorative iron fences, and last, to my fancy, come the pickets. But above all, do not build your lawn fences too high, they may give the protection just as securely, and not be high walls shutting out your own view and also that of the passer-by.

Perchance I have dwelt too lengthily on out-of-door arrangements. Now I'll to the house.

Let it be neatly and tastefully built, though the outlay may not be above a few hundreds. If you have an addition to make to the main part, let it be in the shape of a wing, rather than at the rear of the house with a shed roof; for the improvement in the looks will many times compensate you for the few dollars of additional outlay.

Some person has said that "it is getting to be everything

for looks in this world." Well, our eyes certainly always have been guilty of the accusation.

Then as the kitchen is one of the principal "spokes in the wheel," let it be roomy and well ventilated. May it be airy in every sense of the term, but above all, sisters, do not let its use become perverted; do not degenerate into the fashion of using it for the sitting-room, for the sake of keeping that honored room closed, only opened to the echo of visiting foot-steps.

Someone has remarked that "a child brought up in the kitchen will always have kitchen manners." That the decorum of a kitchen should not always be good, I will not say, but you all know we have little time to think of aught save our manifold duties while engaged within its walls, but after its tasks have been mastered let us adjourn to the sitting-room and, if we are the possessors of parlors, we will have them built with folding doors, so that when we sew or when we read, when we are in the society of our families, we may enjoy what of beauty it may be our good fortune to collect around us. And let us here record a vow never to allow ourselves to be tempted to furnish a room so nice that it may not always be used and enjoyed by the family.

A feeling akin to sadness comes o'er me whenever I pass a farm-house whose front shutters are all closed, and only from the kitchen, in the rear, comes a feeble gleam of light, proclaiming that the inmates are not all from home, as I at first supposed, but have only shut up the pleasanter part of their house, furnished, oft-times, with luxuries hard-earned and by some denials, withheld, to be opened "when some one comes."

O, mothers! if you could only realize that this shutting up of houses is the shutting out of our sons, yea, and of our daughters, too.

It is, I think, truthfully said, that one of the strongest and most common inducements for the sons and daughters of farmers to leave the country for a city life is the neglect of parents to beautify home and teach children to love it because everything around it is more cheerful, more beautiful, more pleasant, and more enticing than any other spot known

to them. Instead of this, it is painfully true that quite a portion of our farm-houses are, in many respects, exactly such places as children of intelligence, who chance to see or read of the attractions of other places, are most anxious to leave.

Therefore, to prevent the exodus of our children so soon as they are old enough to get ideas of their own, let it be our life study to make them sensible that their home is equal in all the little attractions that serve to make life worth the living, to the homes of other children, and infinitely superior to any gilded saloon the city may boast of.

If our houses are small they are the more easily painted and made to wear an attractive appearance, and there is no reason because of their smallness, that their interiors should be inconvenient or uncomfortable.

"Make your home both neat and tasteful,  
Bright and pleasant, always fair,  
Where each heart shall rest contented,  
Grateful for each beauty there."

Then we must have music; ever try to cultivate it—it brings a soothing influence; many a sad heart is lightened, many a care brushed away by a cheerful song or a sympathetic air played upon some instrument.

Then books, something to read, good, well selected reading matter; and in our selections we cannot be too careful, for the young eagerly grasp, in their thirst for knowledge, everything within their reach.

Some one has said "Read few books, by fewer authors," and perhaps it would be advisable not to take in too wide a range. But let me urge upon mothers to find more time to read, that they may be better informed, better teachers. She who dare not find time to read a few moments each day neglects a duty to herself as well as to her family.

Let us have games. I can hardly think of any that would be objectionable for the home circle; indeed, we may be sure, if any are forbidden, those are the ones human nature will have the curiosity to learn. In their participation we must all join, for old as well as young need recreation,—then no fear that proper decorum will not be observed.

I need not suggest to you the cultivation of flowers, for there is not one of us who does not know the refining influence shed by the blooming of one flower, in however rude a cot.

Now, with all these attractions within the reach of all, our homes ought always to be looked back upon, when our children, arrived at maturity, go out to fill different stations in life, as the brightest picture memory hangs upon the walls.

We must teach our children that "there is no place like home," is not merely a song.

We do not expect for a few years, at least, to occupy the Presidential chair, but we hold the scepter, home influence, a mightier power than was ever vested in king or emperor—that of moulding the rising generation, that they may be fully fitted to fill higher places than we now occupy—to uphold the banner of justice to all.

I look upon a love of home, as one of the virtues that we, as a class, are in danger of neglecting, in fact a dislike for home, among the young, is quite too common, and the old homestead is parted from with as little reluctance as an old shoe, and often for the same reason, it is "down at the heel."

"Seek to make your home most lovely,  
Home should be a smiling spot;  
Such a home makes man the better  
In lofty mansion or a cot."

I hope you will pardon me for dwelling at so much length on this theme, for it has ever seemed to me of the greatest importance,—a well ordered home.

In our ambition to add to our resources and extend our boundaries, we become more isolated; from this fact comes one more wide felt want, the lack of organization; that it is supplied in a degree, is true, but it is by no means effectual.

The work of organization should go forward until all producers are banded in one cause, having for our object, mutual advancement in all directions.

After having decided that an organization of some kind must be effected, let your preference of the several orders, each having good for its aim, be for the one whose ritual

contains the least of ceremony, lest after the novelty has worn off it becomes monotonous, and the object defeated by a long and tedious routine.

You will, of course, deem it necessary that the ladies unite with you in the undertaking.

Do not consider now that the work so "well begun is half done;" do not lose sight of the fact that we are banded together for mutual good, to make us better farmers in the term's broadest sense. We must not depend upon our officers to provide us with an intellectual treat each evening in order that we lose not our interest, but each one of us must consider it a privilege to contribute something entertaining.

I seems to me that if farmers could only be awakened to a realization of the strength such unions afford, they would arouse themselves from the lethargy into which they have fallen.

We lack proper representation ; indeed, we have no share of representation at our nation's capitol—and why? We form about three fourths of the population of the United States. You will readily see what proportion of representation we are entitled to. Why do we not have it? Why are we continually sending men of other professions to represent ours, rather than men whose sympathies are with us? Have we sold our birthrights? Shall unrepresented taxation be the largest legacy we leave our children?

Can we not realize that we are menaced with dangers on every hand? Wealthy corporations, like the "Old Man of the Sea," have so fastened upon us, that unless we exert ourselves with a will, they will not relax until we sink exhausted. Oh! that you successful grape cultivators could tell us of some new seedling—some wonderful hybrid—from whose luscious clusters a nectar might be distilled, a quaff of which would so stupefy the monster that we would be able to release ourselves from his clutches.

Let us work with a determination to place men from our own ranks in office, who will come home with honest tickets in their hats rather than suspicious railroad passes in their pockets.



To those who have labored so earnestly for our cause, and have failed in gaining the success they anticipated,—be not discouraged, you will yet succeed. The wheels of progress never turn back, though they may for a time be impeded. And —

“No life can be pure in its purpose and strong in its strife,  
And all life not be purer and stronger thereby.”

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### PROGRESSIVE HORTICULTURE.

BY J. S. HARRIS, LA CRESCENT, MINNESOTA.

*Members and Friends of the Wisconsin State and North Western Horticultural Societies—*

To the people of this beautiful city of La Crosse and you the honorable guests of the North Western Horticultural Society, I will say that the greatest part of my life has been spent in the study and pursuit of horticulture. I came to this region with the first advance of civilization, when Minnesota, my present home, was almost entirely a vast wilderness, and before orchards and gardens had found a place here, and when on account of the severity of the winters it was very generally believed fruit culture could never be successfully pursued. This place, which is now the home of over twenty thousand people, who rank in intelligence, enterprise and prosperity equal with a like number on any part of the globe, was a little village of about thirty houses upon a prairie of drifting sand, almost destitute of all vegetation except sand burrs. I came from a land where fruits were abundant and easily grown, and brought with me a great relish for fruits and almost an adoration of flowers and beautiful home surroundings. Thirty-three years have since passed over the scene and a most wonderful transformation has taken place, and during those years I have improved every opportunity to encourage the beautifying of your city and homes by the planting of flowers, fruits, shrubbery and trees about them, and the

adornment of city and country. And now and in the future, here and everywhere, I am the advocate of progressive horticulture.

Horticulture is defined as the most perfect method of tilling the earth so as to produce the best results, whether the products are objects of utility or of beauty. Literally it means gardening, gardening for pleasure and gardening for profit, gardening of every kind and in every place. Caring for the cheap plants in the window of the poor laboring man's cottage, and the rare and costly exotic gems in the conservatories and bay windows and beautifully laid out grounds of the great and wealthy; growing simple vegetables upon the cramped town lot for the home supply, or upon broad acres for the market; the little patch of the most common fruit, or great commercial orchards; planting shrubbery upon the lawn, shade trees along the highways, and forests in waste places and upon the prairies of the great west, for the benefit of future generations. These all are gardening; so, too, is the keeping up of beautiful parks with shady drives, and the adornment of the grounds of schools, churches, hospitals, prisons and cemeteries — and I will include more, the cultivation of those home plants, your children, in virtue, morality and temperance: to teach, assist and encourage all who are engaged in any of these pursuits is the mission of horticultural societies.

Horticulture is a gracious art which, through all time, has been a symbol of peace; an art joined in closest ties with nature, and her helper in the daily miracle by which she clothes the earth in beautiful garments. Her amiable genius ranges the world with indefatigable industry, and gathers and nationalizes, and adapts to the use of men whatever can regale the senses or sustain life and tempt the appetite. And then comes the application of her art. It is to sow and plant, to prune and train, to transplant and propagate by budding, layering, marking — by cuttings and grafting. There is no other occupation of man that is so ample in its range or so multiplied in its allurements, or that is calculated to affect us with more wholesome influence, or fill us with purer sentiments or holier aspirations.

The history of horticulture or gardening can be divided into three sections, viz.: the "Ages of Antiquity," commencing with the earliest accounts and terminating with the formation of the Roman Empire; the "Ancient Ages," from the rise of the Roman Empire to its fall; and "Modern Times," from the close of the second period to the present day. In the first of these periods we have the Garden of Eden, Noah's Vineyard and the other gardens mentioned in scripture and tradition. The history of them that has been handed down to us is meager and mythical and we have no convincing evidence that they or the Gardens of the Gods in any manner excelled or anywhere near equalled the most ordinary gardens of our day. In a very early age Persia and Assyria were noted as being the most refined and enlightened nations upon the earth, and their gardens were famed for their romantic and picturesque situations. Persia is credited as the native home of most of the popular fruits in cultivation at the present time and its gardens were filled with fragrant flowers, cooling vegetation and refreshing fruits. The same may have advanced to Egypt and had probably been grown there from time immemorial. That the Egyptians in the time of the Pharaohs held the tilling of the soil in greater veneration than any other employment we are led to infer from the words of instruction by Joseph to his brethren before presenting them to Pharaoh, "And it shall come to pass when Pharaoh shall call you and shall say 'what is your occupation?' that ye shall say, 'Thy servants' trade has been about cattle from our youth even until now, both we and also our fathers: that ye may dwell in the land of Goshen; for every shepherd is an abomination unto the Egyptians.'" (Genesis XLVI., 33-4.)

As they advanced in wealth and civilization the Greeks appear to have copied their architecture and gardening from the Persians. Ancient history gives us but little light upon the subject, but one author says, "They first built stately residences sooner than they came to garden finely," as if gardening were the greater perfection, which is a truth and history to-day repeating itself in this country.

The second or Roman period is the first that boasts of any

very interesting writers upon the subject of horticulture; and most of their works have been lost. Among those which come down to us are the writings of Cato, Varro, Pliny, Virgil and Columella; and the earliest gardens mentioned in Roman history were those of Tarquinius Superbus, the seventh and last king, and of the farmer and wealthy general Lucullus, the latter said to rival those of eastern monarchs in grandeur and doubtless patterned after the traditions of the "Gardens of the Gods."

The accomplished nobleman and philosopher, Pliny, possessed two villas—one for summer and one for winter residence—which have been very particularly described, and they are said to have created the taste for, and given the style to, European gardening for a century and a half, and to have had a striking resemblance to the Dutch and French gardens of to-day, with their little flower beds and walks bordered with box and other trees cut to fantastic shapes. Gardens filled with roses, violets, and other sweet-scented plants were in great repute among the ancient Greeks and Romans, but unless there was a great deterioration in plants during the dark ages that followed the decline of the empire, they must have been tame affairs compared with some modern gardening, for the improvement in such plants during the last hundred years has been marvelous.

The third or modern period of gardening extends from the fall of the Roman empire to the present time. During the earlier part of this period Europe was sunk in a barbarism of almost midnight darkness, and during that period the noble art was only preserved by the attention paid to it by the monks; and it was not until the fifteenth century that it was revived, and, with the other arts, began to attract attention. The most celebrated gardens of that time were those of Lorenzo dei Medici, and the most remarkable one that of the royal residence at Milan. The park contained three thousand acres, and, besides, there were gardens; of culinary vegetables, and botanic and fruit gardens, but there is no evidence that they contained anything better than the primitive varieties in cultivation by the Persians ages before, and they were the possession of the great and wealthy only. Dur-

ing the following centuries the science of gardening seems to have broken loose or escaped beyond the grounds of kings and noblemen and spread through almost all Europe, but was as well understood in France as in any country on the continent. In later years the work of bringing the art to the greatest perfection seems to have started in the British Isles. The stimulus that has since carried it vigorously on seems to date back to the sixteenth century, previous to which time but little is known of its development, and the advance has been much more rapid since the construction of conservatories has been practiced for the protection of tender and exotic plants. And at the present time, in many of the countries of Europe, young persons are trained up in the art of gardening, and are as thoroughly drilled and educated as men who are to follow any other profession.

In our country a high grade of horticulture is but in its infancy, but most wonderful advances have been made within the last fifty years, even far beyond those of wealth and population, and present indications are that the time is near at hand when the gardens of America shall surpass those of all other countries. It has here enlisted ability, skillful energy and knowledge to push the work and meeting here, as it will, the approbation of all classes of people, it is bound to lead men to distinction as surely as any other profession. Of what greater names can our nation boast to-day than those of Wilder, Downing, Thomas and scores of other kindred spirits that are to-day household words in every American home? Horticulture, if broadly pursued, is in itself an educating power—and no other pursuit can surpass it for training the powers of observation. The mind of the true horticulturist is always on the alert to detect the working of the principles that govern nature's laws and carry them to their practical application. The world is to-day indebted to horticulture more than any other one art for its civilization, refinement, virtue, morality and true Christianity; and as the years roll on and population increases it will continue to gain importance.

Horticultural societies are a means of usefulness that should be encouraged and liberally sustained and they are

yet in my opinion destined to exercise an influence for good hardly surpassed by any other society. If this society shall be sustained as it ought to be by the citizens of the city and the farmers and gardeners in the adjacent country, it will accomplish a vast deal of good. If sustained it is bound to kindle horticultural tastes, and diffuse a love for the cultivation of fruits, flowers and vegetables, that shall exercise an elevating influence upon all of your people, and will also supply your tables with the most wholesome and appetizing food. It will incite emulation in and around your homes. It will create for you parks and pleasure grounds, where the weary sons and daughters of toil may occasionally resort to get away from the monotonous hum of machinery and the turmoil of business, and breathe God's pure air and commune with nature. As horticultural tastes are improved and more and better fruits are placed within the reach of the masses, many of the temptations that allure the youth to haunts of vice and intemperance will be disarmed or removed. It will continue to add new beauties to your city, and as they unfold their benign influence will reach out far into the country on every side. The city of La Crosse could not do a wiser thing or make a better investment than to give the North Western Horticultural Society substantial encouragement, even to the extent of furnishing a hall for its meetings and exhibitions, and providing for the expenses of weekly or monthly meetings and exhibitions. Judicious and well directed liberality would promote her honor and extend your influence. Finally what I say to you citizens of La Crosse, will apply equally to every city and village in Wisconsin. And now let us ever remember that the mission of *Progressive Horticulture* is not narrow and personal, but generous and broad, and that our rewards shall come in a consciousness of having bettered the condition of our race; and let the watchword ever be Onward! until city and country shall be transformed into a second Eden.

HORTICULTURAL MUSINGS AND OBSERVATIONS  
ON THE PAST.

By A. J. PHILIPS, Blount, Dakota.

There is a saying "'Tis sweet to be remembered." I feel the force of it this winter, and for fear I may be forgotten I write a short essay on the subject named, yet trust that some one who wields an able pen will pursue the subject in the future, and perchance advance some thoughts and ideas that will guide us in our labors in this our favorite calling. Five hundred miles away, making a residence to perfect a title to some of Uncle Sam's dominion. I see that I must deprive myself the pleasure of meeting with my Wisconsin and Minnesota horticultural friends this winter, but I shall look anxiously for a report of your success at the great New Orleans exposition, and sincerely hope that when another year rolls around, I will have the pleasure of again meeting with you. Absence from Wisconsin the past season will cut off my report on observations, so that all I can give will be a few items relative to my own orchard. In the fall of '82, my orchard was loaded with fine fruit. Many of the young trees, more especially the Wealthy, bore too heavily, so that to ripen the fruit exhausted the trees to such an extent that they were poorly prepared for the coming winter. Consequently in the spring and summer of '83, many looked weak and sickly, as J. C. Plumb can testify. Through the winter of '83 and '84, I was corresponding and inquiring with a view to looking up a more favorable place to pursue this, my chosen calling, where perhaps the climate was not so severe and the losses not so great.

In the spring of '84 I started west through Minnesota and Dakota, intending to visit Nebraska, Missouri and Arkansas before my return, but on reaching Central Dakota I found some choice land still vacant and concluded it would pay me to stop here at least one season. The climate and soil are very desirable and if the rainfall is sufficient, it will be a desirable country when it is cultivated and forests are planted and cared for. Fruit I think will do as well here on

the Missouri slope as in Central Wisconsin. Before leaving Wisconsin I rented my farm and orchard to a careful man, and when he wrote me in May he said, Oh! if you could see the apple blossoms on the hill, you would not exchange it for the whole territory of Dakota. My thoughts then often wandered back to the orchard and to the associations connected therewith, and when September came and they began to ship Tetofsky, No. 20, and Duchess, I was more than pleased. Such magnificent, to me, Duchess I had never before raised, they were the admiration of all who saw them. In September I returned to Wisconsin and spent nearly four weeks packing and shipping apples west and attending the Wisconsin state and the La Crosse county fair. At the last named place we made a fine showing. Spent most of October here in Dakota and November in Wisconsin cutting cions, digging trees and preparing for winter. Never saw the young trees of Duchess, Wealthy, Wolf River, McMahan's White and Peach apple look more promising. This gave me new courage. I adopted the plan of picking two weeks earlier than I had formerly done, for two reasons. First, they stood shipping five hundred miles better, and second it gave the trees two weeks more to prepare for winter. Had a nice crop of apples and wherever I shipped the Duchess and Wealthy they brought orders for more. The Wolf River was also much admired and I have concluded I have not trees enough of this variety.

In my musings I often think of my individual losses, but I find they are small compared with our societies' losses in both Wisconsin and Minnesota. Our Mrs. Lewis's intelligent and pleasant countenance will no more be seen, nor her excellent papers be heard in our halls. That voice is still in death. When I turn to our report for '80 and '81, page 38, and peruse that valuable paper on the Psychology of Country Life, I can but wish that that production could be in every farmer's library in our land. Those appeals for the overworked housewife should not go unheeded, and in the same report is an interesting paper on the Birds of our Gardens, that will bear reading and re-reading. And while the east has lost her John A. Warder, our sister state Minnesota has lost



her John A. Warder in the person of the Hon. L. B. Hodges, of St. Paul, the champion of forestry in the west and the friend of the cottonwood. When he rose to read his last article at their annual meeting in 1883, it was the writer's privilege to hear him. His voice was stern, his manner easy, and his arguments practical, soon convincing his hearers that he fully understood and was in earnest in the important subject he was handling. His death was not only a loss to Minnesota, but to the treeless region of the west and northwest. But his labors are done and a great man has gone to his rest. His last paper in the Minnesota report for 1883, should be in the hands of every farmer and tree planter in the west. In my musings I think of the many pleasant visits I have enjoyed in Illinois, Minnesota and Wisconsin with my horticultural friends. When I hear market gardening discussed or large strawberry crops mentioned, I think of our worthy President; when I see or hear of the Wealthy, either fruit or tree, I think of my esteemed friend Gideon and his amiable wife; also of the late Dr. Jewell, who sold me my first trees of that variety, and of Saul Foster who first called my attention to it. Who can say what Peter M. Gideon did for the northwest? I think of Whitney and his hospitality when my attention is called to the No. 20, and that is often. I think of A. G. Tuttle and his life work at present when I hear the name Russian; of J. C. Plumb when I hear soils for fruit growing called into question; of Freeborn and Hatch when I see or hear of McMahan; of friend Pepper and his resurrection when my attention is called to the Pewaukee, or the subject of hybridizing is mentioned; of friend Kellogg when I hear new strawberries, pears and plums discussed; of Charley Hirschinger when I read of large fruit exhibits; of Uncle Reed and Greenman when I read of grapes; of J. A. Wood and Pilgrim when I see or hear of large grain exhibits; of friend Palmer and his good butter when I see or read of a Jersey cow; of friend Stickney when I read of cranberries or horticulture in a general way. I think of the late Elder Alcott when I see a large Utter apple; I think of the honesty, perseverance and energy of Uncle Wilcox when I hear men say they have

given up apple-growing in the north; of Sias of Rochester, Phoenix of Delavan, and Springer and Bennett of Waupaca Co., when I hear of new seedlings; of I. N. Stone when blackberries are talked of. But I must close, as I could continue my musings in this way almost indefinitely. I think horticulture is advancing in the Ninth district of Wisconsin, and there is quite an interest manifested there. I attended one day, and showed Duchess, Wealthy, No. 20, and some of my green winter seedlings last fall at the Beadle county fair at Huron, Dakota. My apples and one exhibit from Rochester, Minn., were all the fruit they had. I formed the acquaintance of several horticulturists and found quite an inquiry among the farmers for trees that would bear fruit in this climate. Near the Missouri, and twenty miles back in the country, grapes and wild plums grow in abundance, which is encouraging. I have received an invitation to read an essay at the Territorial horticultural convention at Huron on the 5th of February, so I may be in convention with horticulturists while you are assembled.

Wishing you a pleasant and prosperous meeting, I remain yours,

A. J. PHILIPS.

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## WISCONSIN HORTICULTURE.

By C. G. PATTEN, Charles City, Iowa.\*

Having been a resident of Wisconsin from 1848 to 1862; first of Walworth county, and for nine years of Dane county, and a frequent visitor in your state, I may be permitted to suggest a few thoughts for the encouragement of Wisconsin fruit growers. But first, let me say that almost my first lessons in horticulture were from the old *Wisconsin Farmer*, and therefore I feel the more my near relation to the fruit growers of that state.

Draw a line from La Crosse to Baraboo, and thence northeasterly through Lake Winnebago to Lake Michigan; and all that portion south of this line, will compare favor-

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\*In *Western Farmer*.

ably or more than average in natural advantages for fruit culture with the state of Iowa. These advantages are: first, the great body of water along the eastern and northern border of the state; second, the wide extent of forest reaching through all the central and northern portions, and the lake atmosphere reaching from thirty to sixty miles inland, while at Madison and Baraboo you can grow many varieties more successfully than can we in the northern half of Iowa; such varieties as Fameuse, Tallman Sweet and Seek-no-further doing fairly well there, but not so in this state.

That portion of your state has great forests at the north and west, while we have the great prairies for a thousand miles to the north and west. Thirdly, you have a greater variation of soil, with excellent natural drainage, while we have usually a heavy clay, and generally a more level surface. You have elevations for the large fruits and shelter for the small fruits. At Baraboo we saw maples in the valley, with twelve feet of dead tops, while in Mr. Tuttle's grounds, on the hill adjacent, we saw pear trees of twenty-five years' growth, and Fameuse apple trees of great size and in apparent health. This shows the value of comparative elevation for fruit growing. You have also the additional advantage of long experience in selection of varieties, and of obtaining new ones from the numerous seedlings which everywhere abound in the older sections of your state.

I would here urge your horticulturists to seek in every corner of the state for new and worthy seedlings, and to plant the seeds of good and hardy fruits to the same end. The Russian apples will be of more value in your state than in Iowa, especially in your northeastern section where it is more uniformly cooler. There they will blight less than with us.

Selection from old lists is good, but we have about exhausted them. Our main reliance must be upon native seedlings and their adaptation to a given location. The Pewaukee is all right in the lake regions where it originated, but a failure here.

The Turner raspberry will do here, but begins to fail as we go west of the divide in western Iowa. None of the

lauded sorts of Lower Canada and northern Vermont have proven as hardy here as the Fameuse, which is far from perfect. We need hardier plums, pears, cherries, raspberries and grapes.

*Nature's method is to plant seeds.*

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## THE CRANBERRY INTERESTS OF WISCONSIN.

By C. E. MORGAN, Madison.

There are undoubtedly many operators in the state who could contribute valuable articles on cranberry culture, but public information is so limited upon the subject, and yet so much needed, that I have with some reluctance ventured to submit the result of a few years' experience, and a good deal of investigation, with the conclusions forced upon me by them, and from a careful study of the very little literature accessible treating upon it.

This consists chiefly of the published reports of New Jersey, now "American Cranberry Growers' Association," mostly statistical; and of the Agricultural Department, at Washington, which are largely compilations from this society. Apart from these there seem to be no authoritative publications, except two or three very limited works published some years since, better adapted to eastern marshes than to our locality. As it legitimately belongs to horticulture, and there being no association in the state for its furtherance, we desire to lay the subject at your door, and ask your co-operation in some feasible means of bringing its claims to the notice of the public.

The cranberry, like the strawberry, is propagated from the vine, but, unlike the strawberry, it requires from three to five years to produce a bed from which any amount of fruit can be realized, and that with the most thorough cultivation; while in the manner in which most of the marshes are conducted, from ten to twenty years are required to realize the full benefit. There are so many departments of labor connected with it that we can only allude to, without dis-

cussing them; and yet they are as important as the many items in strawberry production, which commands so much attention, although local in its usefulness; while the cranberry is also an article of commerce throughout the Union, and its production limited to localities especially favored by natural facilities.

The first efforts at cultivation are understood to have been made on the Massachusetts marshes about the year 1820; and some years of experiment were required to demonstrate its success, when others engaged in it. But not until about 1845 had success been fully assured by producing such beds of fruit as to awaken any general interest. This is recorded as the first boom in its favor. Cranberries were at that time selling in the Boston and New York markets as high as from 50 to 75 cents a bushel.

From 1860 to 1865, New Jersey caught the inspiration. Marshes were there established on scientific plans. The bogs were cleared from all superfluous vegetation and a bed of sand 4 to 6 inches deep spread over the surface and planted to vines. With nothing to obstruct their spread they rapidly multiplied, and in from 3 to 5 years large amounts of fruit were gathered and the vines continued their growth until solid mats were formed with enormous production.

What would have been the result at the present day can only be conjectured, but for a set-back received from a disease which destroyed whole fields of fruit when approaching maturity. This disease, termed "the rot," and unknown in Wisconsin, has baffled the skill of all attempts to overcome it. Science, time and labor have been unsparingly devoted with great expense, to reach and remedy it by the application of chemicals. Lime, sulphur, potash, copperas and various phosphates were lavishly used and the wisdom of experts was enlisted, without finding any sure specific.

It yet baffles the investigators, and, from time to time, in different localities, continues its ravages. "Wholesale dying out of plantations of vines from disease are reported as of frequent occurrence in New England and New Jersey. Dead from root to branch, which the oldest growers are unable to account for." Their most rational conclusion

seems to be, that the disease rises from the fermentation and decomposition of the bog, and, we believe, the absence of some virtues of our Wisconsin marshes, which exempt us from it. We cannot resist the conclusion that these virtues consist in the quality of our surface water, fully tinctured with the resinous properties of the pine and tamarack, and strong in the solution of iron.

The fact is that our central territory is underlaid with an extensive sand rock, porous in the extreme, but exempt from any internal channels through it, thus forcing all surface water through the extended bed of sand above it. The depressions upon this bed, receiving the vegetable washings of ages, constitute the marshes of bog and peat upon which the native cranberry luxuriates, being found scattered throughout this whole region.

In consequence of the losses sustained by this disease, year after year, old marshes are abandoned and new ones laid out and planted; the gross profits realized warrant the continuance of this. Some eastern operators, after a recent inspection of our advantages, have remarked, that with the competition we are capable of, their marshes must eventually give out, and they will have to look in this direction for their supplies. From our cheap lands and their superior natural advantages, with capital and labor wisely applied, there is little doubt that the fruit can be produced for much less and possibly for one half its cost to eastern growers. What is said of the New Jersey marshes applies in part to New England and Long Island. Other items of interest, such as insect depredations, frosts and water control, as compared with ours, are important, but time will only permit us to mention them.

We find from the reports of the New Jersey growers that their marshes cost from \$200 to \$1,000 per acre. A condensed statement reported by the Agricultural Department at Washington says their average cost exceeds \$350 per acre.

When we contrast this with the outlay on ours in Wisconsin (excepting a very few which have been wisely and efficiently operated), ours are hardly worth summing up, probably \$10 an acre would be an extravagant average esti-

mate. A few statements which we have already published, taken from statistical reports, will illustrate the contrast between efficient labor there and the general practice here. Incidental mention is made of "forty acres producing 6,000 bushels, and eight acres yielding 1,400 bushels, and all destroyed by insects and 'the rot.'" Also mention is made of a plantation of about fifty acres with 13,500 bushels for its first crop, and a report of 1880 notices "ninety acres netting \$25,000 above all expenses, being 80 per cent. of the entire cost of the plantation."

Some credulity may be required to entertain the truthfulness of these statements; but there are producers here who could demonstrate the facts in their own experience; they are, however, prudently reticent upon the subject. Yet what seem to be reliable reports speak of \$52,000 as the value of a single crop on not a very extensive territory. Also, \$16,000 paid out in a single year for additional water facilities by one company. We surrendered our doubts on a single test, from a favored spot, three feet wide by eighteen feet long, from which a bushel of fruit was gathered; a ratio of nearly 800 bushels to the acre. And this is not impossible on a larger scale, with conditions equally favorable.

The territory adapted to this crop in Wisconsin is immense, and for advantages, we believe, all things considered, unexcelled by any other state; and we need only the capital and its proper application to make it the most productive and profitable of any industry in the department of agriculture or horticulture existing here.

The country around these marshes is forbidding for settlement; slight elevations of sandy knolls, tamarack swamps and dwarf pines, with here and there a patch of better timber; the bogs frequently overgrown with high and low bushes, willow and feather-leaf and sage brush, showing its power for prolific growth in such vegetation as nature has planted there.

In nearly all this territory, on depressed portions, the cranberry vine is indigenous, waiting for the hand of man to remove the obstruction and permit it to propagate and yield up its wealth. Why we are so behind in the business,

is a question naturally arising, and which it is my purpose at this time to notice. First, our advantages are so little known that but a very few of our marshes have been cultivated with any degree of interest; and most of those on the progressive plan; working little by little from year to year as time and means permit, until a profit can be realized to aid in further expenditure.

A few parties more appreciative, have concentrated their labors upon small pieces of territory, and by thorough working, have made their little patches attractive as a nucleus for extensive operations, which have proved mines of wealth to the originators. The Sacket in Berlin, and the Baar marsh, near the Wisconsin Valley Railroad are notable instances.

The country is forbidding for residence to those who desire more congenial locations; and the settlers are made up of pioneers and lumbermen, with little means and time to devote to the culture; yet there is no one who has a residence here who is so poor but he owns a cranberry marsh of forty acres or more, which can be bought with a month's labor.

Thousands and thousands of acres are found among our state swamp and drainage lands begging for investment at from fifty cents to a dollar an acre; and also in railroad lands, contiguous to outlets, at mere nominal value compared with prices for agricultural lands proper.

Fully three-fourths of these residents have no means to improve their marshes, and the little they do on them is with the hope that nature will supplement it with a blessing.

Thus far the largest crop produced in the United States is reported in 1880. Total 492,000 bushels, New England 247,000, New Jersey 128,000, Western (mostly Wisconsin) 113,000. There are great variations in different years, and proportionately, Wisconsin has shown much better figures since. Michigan is also in the field, but her fruit is not in good repute among dealers.

It is clearly evident that could our advantages be appreciated, capital and labor attracted, and the work be prose-



cuted so as to develop them, this (in the language of a tourist) "miserable, God-forsaken district of bog and foul vegetation" can be transformed into enviable gardens of wealth and beauty.

In conversation with an intelligent gentleman, whose interest and experience establish his authority, we remarked that there were bodies of marsh here that could not be bought for \$500 per acre. "\$500," he replied, "\$1,000 would not measure the best of them." And there is abundance of wild country just as good to be had for fifty cents an acre, and the money handed back to the towns to be expended for their improvement.

The country is not unhealthful, but, on the contrary, conducive to health. Invalids, suffering from disorders such as dyspepsia, indigestion, inertia, etc., find an antidote in the water and air, inciting a healthy appetite, and they need not incur the expense of a trip to Florida to produce action required to contend with insect pests; the mosquitoes and deerflies in this region are ever ready to dispute the right of pre-emption with them.

Why interest cannot be awakened among growers for a state association for mutual benefit is answered by the fact that most of the operators already know more than they are able to practice; their greatest want is means to execute; while the few liberal workers, with longer purses, after patiently waiting for the results now being realized, do not feel disposed to publish all they have acquired, but invite others who would compete with them, to invest *their* means, to labor and experiment as they have done, and wait for the results from the use of *their own* wits and work.

This society could aid in awakening public attention by setting apart a time for the consideration of questions arising, and inviting discussion from any who could contribute, giving facts and the result of experience. Facts are what are needed to establish public faith.

This effort should be supplemented by some state action which would give an impetus to the enterprise, and stimulate our people to a realization of the wealth of our marshes, little dreamed of at the present day. The state of Wisconsin

sin is not usually found lagging in profitable enterprises, and not until recently have the labors of the past given such assurances of success as are now being realized by the full maturity of some of our cranberry plantations.

The abundance of these lands proves a check to speculations which would otherwise spur the industry; nor can parties enter into the business with expectations of immediate dividends from their investments. They must be worked by interested and intelligent heads; and it is to be regretted, that there are no written authorities to aid the cultivator. Much labor and expenditure is in consequence misapplied, and operators are compelled to rely on their own sagacity in adopting the most feasible, from the many conflicting methods in practice.

The questions demanding investigation are frosts, insects, control of water, construction of dams, ditches and reservoirs, getting rid of brush and moss, planting, harvesting and curing fruit, etc., for which we find no authority except some few suggestions from time to time in the *Western Farmer*, called out by the investigations of the writer. An able eastern writer says, "There is probably no branch of industry as large as the cranberry interest which has received so little thought from intelligent men."

Our correspondents and others have suggested that a stimulant to the enterprise may result in over-production and unremunerative prices. This, in the face of the past, seems idiotic. There are citizens of Madison who remember when cranberries were hawked about our streets for 50 cents a bushel; and although our production has doubled within the past ten years, the large crop of 1883 sold to average over \$8 a barrel, while January, 1885, saw the short crop of '84 held at \$15 to \$20 in the Chicago market.

With thorough tillage and improved means of gathering, they can be produced at a cost that will make them welcome at the tables of the most humble where they are now rare visitors. Our market is the civilized world; our territory sufficient to supply it. Europe has nothing to compare with us.

A little study has shown us that much can be done to

counteract frosts through the signal corps at Washington and minute guns echoing the warnings over our marshes. Insect depredations find an antagonist in our kerosene torches and pan, which give us surprising results and opportunities to define their characters; and much light has been shed by the industry of the few who desire to investigate, and yet we are but in the alphabet of knowledge on the many questions arising.

As an illustration of the want of knowledge among operators, I will mention a single instance (they are many and varied). Word came to us that a party who, at great expense, had cleared off a tamarack swamp where nature had planted the vines, after replanting and waiting in vain for them to spread, found that he "had ruined his marsh," and got rid of it as worthless. The sequel proved that he had drowned out the vines, which needed but moisture, with sun and air, instead of a water-bed, for their propagation.

The most feasible way to reach our present wants, would be for the state to appoint a commission to inspect our territory, defining such localities as present most favorable advantages; to visit the best reputed marshes at the east, and also the most successful in our own state, and by comparing methods of operation, recommend those most worthy of adoption, in a full and elaborate report. Such a document, well authenticated, would attract capital and settlement, resulting in the sale of lands, and improvements in the territory; and would be a valuable acquisition to the industry. It would form a reference book for those engaged in the business, long needed; and, we believe, would initiate work of scientific investigation with a practical application that would eventually make Wisconsin the banner state for the production. The state would also be largely the gainer by the enhanced value of property for taxation; and the counties where these lands are located would at once recognize the benefits of the acquisition.

Our most valuable marshes are now under the control of Chicago operators; and if Wisconsin continues to sleep until the best interests shall be absorbed by foreign capital, as are our lumber interests in the north — *so be it*. A timely

warning, demanding thorough investigation, is certainly worth heeding.

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## THE STRAWBERRY BED.

By MRS. ALEXANDER KERR, Madison.

I have chosen a practical subject and I propose to treat it in a practical way. A friend of mine, a farmer's wife, and a person of excellent common sense, has been giving me some suggestions which I want to repeat and to act upon. She came in with butter and eggs for me the other day, and as she sat by the fire to warm herself—she was bitterly cold—our conversation turned to the common topics of the day. I have learned a great deal, first and last, from her, and it is my way to let her talk on uninterruptedly. At length, she began "I was readin' over the programme of the Farmer's Convention last night, and I see that you are going to tell how to raise strawberries; I don't s'pose now you ever raised a quart of strawberries in your life. You don't look as ef you had; that is, I mean you never set out the plants with your own hands, and took the hull care of 'em yourself. That's what I've always been a tellin' *him*; them that's had the experience and knows just how the thing is done can't write it out and do it up in 'style' to read before the convention. As *he* said to me when he come home from the agricultural meetin' last year. Says he: 'Bless you; you know ten times as much about the real, practical way of doing things as these city ladies that read their compositions off so glib; but there's no use talking; you couldn't get up there before a room full of folks, and tell your experience to save your life; and I do' know as I should want you to, neither. I like the old-fashioned way of having the women folks stay to hum, so as to keep an eye on the place. 'Now,' says he, 'we farmers go up to Madison, and we have our say, and our talk is took right down and printed, and mighty interest-

ing readin' it makes, accordin' to my notion. The fact is, we learn more about practical farmin' from them plain speeches, without any fuss or flurry, than we do from the high-falutin' lectures or whatever you call them, of the professors and such."

"Well, what I was a goin' to say was that I was thinkin' I might give you a little of my experience so that you could have something sensible to say, and not have your essay all made up of things you had learned out of books, with a little poetry tacked on to make it sound nice."

"I shall be very glad to have your help," was my reply. "I suppose I may ask you questions on the points I wish to write upon?" "Ask all the questions you want to, but when I get to talking, it's hard to stop me, you know that well enough. So you may let me go my own gait, and get in questions edgeways if you can."

"Now, if you're goin' to have a strawberry bed, you want to look out a good place for it. Don't be put off with any patch of ground where nothin' else will grow. Pick out a sunny spot, sheltered a little. That reminds me, I believe I'll tell you about the first strawberry bed I ever planted. When my boys were just old enough to go to school—we were livin' in Rock county—we moved into town for a couple of years and we rented a house and a little bit of a garden of the nicest gentleman that ever was; him and his wife lived pretty much by themselves and they had the greatest lot of strawberries, raspberries and grapes you ever see. I remember we moved in about the first of July, couldn't get possession of the house till then, and most every day all that summer, him or his wife would bring in a quart or two of berries, or a few bunches of grapes or something of the sort. They would leave them in the kitchen on the sly, when I was in the front part of the house; for they didn't seem to want us to thank them too much. They had so much fruit they couldn't use half of it, they didn't care to sell it, they was too well off to take that trouble, so they gave it away."

"There was one queer thing about it. Mr. Winchester—that was his name, would never say 'come over and help your-

selves, I've got more fruit than I know what to do with ;' but he would always pick the berries himself. The neighbors did say, that he had a tenant there one year, a minister he was too, and he thought he would be extra kind to him, so he told his folks they was welcome to come over and get berries and grapes, and if you'll believe it, they used to take the choicest of everything so that he couldn't count on nothing for himself. Well, his way suited me; course you know boys will be boys, and if they got to going over into that garden every time they felt like it, there would have been trouble. So the children never picked so much as a cherry, tho' there was one tree that hung its branches almost into the window where they used to sit, and the kind neighbors, they noticed that just as they noticed everything, and they used to pick the largest and the ripest cherries and lay them the whole length of the window sill when the boys were out of sight.

"We got to be famous good friends right away, and though I say it as shouldn't, they seemed to like us all first rate, and one day along in August, Mr. Winchester, says he to me, 'Wouldn't you like to have a strawberry bed of your own? because I have plenty of nice plants that you can have just as well as not, and there's a little spot of ground in that corner yonder, with a high picket fence on the north and on the west that makes it about the warmest place in the garden; it lays just right, and the soil is good and free from weeds.' I could see that myself, so I said, 'I should be proper glad to have a strawberry bed; but its no use talking, for *he* won't be contented to rent the farm only till the two years are up, and if I should go to all the trouble of getting the strawberry bed started next spring, we couldn't get no good out of it, it wouldn't bear none the first season.' 'I mean for you to set out your strawberry plants right away; that is, the first rainy day, when they will be likely to do well.' 'What!' says I. 'Plant strawberries in August? I never heard of such a thing before.'

"'Well, you just try it, for an experiment.' So I had the ground all ready, and along toward the end of the month, after a dry spell, we had a warm rain, and one afternoon

Mr. Winchester brought me over a basket of strawberry plants. He told me the kinds, but I don't know as I exactly remember the names. There was the Jucunda, and some I think he called Triumph de Gand or de Grand. 'Now,' says he, 'don't you set out none but the strongest plants. Its a waste of time to put out a plant with no root scarcely, and I've brought enough, so that you can take your pick.'

"Well, out of that basket full I only set out seventy plants. But every one was a beauty. Seven rows and ten in a row. I put 'em a foot apart. I could not afford to be wasteful of ground in such a little bit of a garden. You never see anything grow as them plants did. Of course I give some time to 'em, but there warn't no hard work about it. If any weeds started, I just went over the ground with a rake after dinner, while the sun was shining pretty hot — did not take me ten minutes — and them weeds were killed almost before they had begun to grow. And then, after supper, I'd take my scissors and cut off the runners, so as to keep the plants nice and shapely. Well, when November came, I had a little clean straw put over the bed, and the winter was mild, so the plants came out all right in the spring. It was wonderful how they grew, and how full they blossomed, and how the fruit set. Of course Mr. Winchester, he took considerable interest in that strawberry bed, and one day, early in June, he says to my husband, 'see here! your wife's strawberry bed beats any of mine. I never see anything handsomer. I've always been proud to show my company round my garden, but, I declare, I never had anything to equal this;' and we noticed after that how he took pains to show it off to his visitors. Then it came into my mind that it would be a good plan for me to keep count how many berries I got from those seventy plants, so I put it down in the almanac. So many quarts every day, as long as they were plenty; along at the last when they were scattering I let the boys eat what was left right off the vines, and by actual measurement I picked from those plants, set out considerable less than a year, forty quarts of the finest, sweetest berries I ever had. After we moved back to the farm I always managed to have plenty of strawberries, and then I got my boys to plant raspberries

and grapes, and to set out fruit trees, all because I had such good luck with my first strawberry bed."

"So it's no trouble to raise strawberries?" I said, as my friend stopped and moved her rocking-chair a little further from the fire.

"Ah, that's only one side of the business," said she; "not that I've ever had any cause to complain myself, tho' sometimes there's a bad season — too wet or too dry, or something, so as I don't get a large crop; but if you want to know the other side, you just ought to hear my Mary tell about her strawberry bed. You know Mary — at least you used to know her — she that married Lawyer Dow, John Dow. She was tellin' me about it this summer when she and the children was visitin' me. You didn't see her baby, did you? The cutest little thing, and pretty as a pink. Well she was a tellin' me about their tryin' to raise strawberries, and I laughed, and I laughed, and I thought I should a died a laughin', to hear her go on. I can't begin to tell it as she did. I wish you could see her.'

"John Dow's pretty forehanded—owns a nice place and is a good provider; but you know yourself how 'tis with these men; every once in a while the best of 'em 'ill get the blues and think the wife is extravagant, and the whole family on the straight road to the poor-house.

"Three or four years ago or so, I forget just how long it was, fruit was scarce and high, they had been payin' twenty cents a box for strawberries all the season, when one afternoon just before tea-time, John and Mary was both sittin' on the front porch when their market man drove up with fresh strawberries and left two boxes as usual. Mary did n't happen to have any change handy, and as John is very particular about having every thing paid for, cash-down, she asked him for fifty cents to pay for the strawberries. Why, Mary said it just took his breath away; he had no idea that strawberries could cost as much as that, tho' between you and me John Dow don't mind paying 25 cents apiece for cigars on occasion, when he has a friend with him. Yes, it almost took his breath away — and all the time they was



eating their supper, he was talking about those high-priced strawberries.

“ ‘Here,’ says he, ‘We’ve got land enough to raise berries to feed the town, and we’ve been victimized and extortionized, and I won’t stand it. Don’t you pay another cent for strawberries this summer, Mary.’

“Of course, he forgot all about it in a week, but by that time the season was over, and there wasn’t any strawberries to be had for love or money. But that idee of raisin’ his own fruit stuck by him all winter, and whenever he had a little spare time he would study the advertisements and write somewhere for a fruit catalogue, and by spring he had a stack of ’em from New York and Pennsylvania, and Wisconsin, Kentucky and Illinois and Canada, even. Then he handed them over to Mary.

“ ‘You’re the horticulturist of the family,’ says he, ‘pick out a list of twenty fruit trees and I’ll order them, and see to getting a strawberry bed started. Have Murphy spade up the ground and when you have the plants, I’ll set them out.’

“Well, Mary told me she rather left it to Murphy to say where the strawberry bed should be, and it seems they hit on a cold, damp place on the north side of a board fence. Mary didn’t think anything about having the soil improved, and all Murphy thought about was getting his day’s work done.

“But the bed was made, and they waited some time for the plants. They decided on “Charles Downing” and “Green’s Prolific,” and sent off for 100 plants of each kind, at 75 cts. a hundred. Mary could just as well written home for plants, but John wanted to do things in a business-like way, and not be beholden to nobody; perhaps, too, they thought these two kinds were better than any I had.

“Them plants came one afternoon in May, just after John had gone to his office, the very day that John had put on his new spring suit for the first time. Pretty soon Mary she heard it a thunderin’ and see that there was goin’ to be a shower. She thought ’twould be a pity not to get the plants set out while the weather was just right, and she got a boy

to help her, paid him fifty cents, and by hard work they got them out, but not in time to escape a pretty good wetting.

"As soon as Mary got back into the house she said she hurried to dress herself up nice again, and about half past five she was sittin' by the window tired to death but pretending to be busy with her sewing when John came up the walk. He had a new Harper's Magazine in his hand, and was more cheerful than common when he came in. The sun was shinin' and everything looked pleasant, and after he had hung up his hat, and was a brushin' his hair before the glass, he says, 'Mary, here's a new story begun by your favorite author Miss Woolson. You read the first chapter out loud, won't you?'

"'But the strawberry plants have come; don't you want to set them out?' He didn't look quite so cheerful for the next minute or two; then he said, looking down at his light-colored, tight-fittin' trowsers, 'I'm hardly dressed for it; they'll have to wait till to-morrow morning.'

"So Mary read aloud till the bell rang, and after tea she showed him the strawberry bed; he was pleased enough, praised her work and asked her how she got the rows so straight, and admired her flower-beds close by and ended with repeating that old proverb, 'Well begun is half done.' But you must remember that there was the whole season though that those plants had to be taken care of, if they was a goin' to amount to anything. Mary said that when she considered how she had paid out three dollars already for the plants and for work on that strawberry bed, she thought that she ought not to hire any more help, and she did as much work as she could herself. John was always too busy — he couldn't take the time — besides, he had all the exercise he needed going back and forth from the house to his office. The consequence was that two or three times along in June and July, Mary came to the dinner table with her face as red as a beet, and when John asked what she had been doing — if the cook was gone or what was the matter — she had to own that she had been working in that strawberry bed. At last he couldn't stand it any longer. Mary got the headache, and John says it's like purgatory

when the house smells of camphire, and Mary has to give up for a whole day. So he gave express orders that Murphy should keep the strawberry bed in order. He gave time enough to it, goodness knows, for his bill was \$4.20; but the plants didn't seem to thrive. They were small and stunted, and John concluded that the soil wasn't rich enough, so one day in the fall, when Mary was away for a week and time hung heavy on his hands, he thought he would put some wood ashes about the roots—somebody had told him it would be a good thing—so he put on some old cast-off clothes, and old boots, and a seedy hat—his own mother wouldn't have known him—and he was on his way to the strawberry bed with a pailful of ashes in each hand when a distinguished-looking stranger called out to him, 'Is this where Lawyer Dow lives?' 'Yes.' 'I am not acquainted with the gentleman, but a friend of his told me that he thought he would be willing to show me the new furnace he has lately put in. But I see the house is shut up, Mr. Dow and his family are absent from the city, I suppose?'

" 'I guess I can show you the furnace—I have charge of things here,' says John. For that furnace was something John had given a good deal of thought to, and the new way of ventilating was an invention of his own; he wanted the public to know about it. So, as he told Mary, he went around and explained everything, looking like a professor of dust and ashes, and never let on as to who he was. The next week the same gentleman came into John's office, and told him about his having been to his house in his absence, 'and,' says he, 'I found a very intelligent man in charge, but I want to ask you a few questions,' and he never mistrusted that the intelligent man was Lawyer Dow himself. And Mary says that was the last time John did any work in the strawberry bed.

"The next spring everything was left to Murphy, but all the neighbors wanted him, too, and Mary's garden didn't get as much care as usual and the weeds got a start among the strawberries; there were blossoms,—not very many, for the plants were shaded too much—and the season was late

and cold. But about the last week in June, Mary had a few strawberries from her own garden. They had a nice flavor and John couldn't praise them enough. They had been having them every day for a week, when, one morning, as John sat down to breakfast, he says, 'the neighbor's chickens were over here, bright and early this morning, helping themselves to your berries and yesterday noon I saw three boys run out of the yard, just as I came up from down town. I think they had been paying your strawberry bed a visit. You had better organize yourself into a police force, if you expect to keep any fruit.' 'I am afraid it's too late,' says Mary, 'the strawberries are almost all gone.' 'Gone! we haven't had a bushel, have we? How many quarts have you canned?' 'Not any, and we have only picked fifteen quarts.'

" 'Is that all?' And how much did the plants cost?

" '\$1.50.'

" 'And what did you pay for spading up the ground?'

" '\$1.00, and paid a boy 50 cts. for setting out the plants.'

" 'And what did Murphy charge for weeding the bed last season?'

" '\$4.20.'

" 'And I paid \$1.00 for mulching in the fall. Let me see, that makes \$3.00, \$7.20, \$8.20.'

" 'Paid out any money for that strawberry bed this spring?'

" 'When Murphy put the place in order he worked there about half a day. You might call it 80 cents; that makes an even nine dollars.'

" 'Nine dollars for fifteen quarts of strawberries!'

" 'That's 60 cents a quart.'

" Mary said John didn't make no answer. He got up from the table and walked out to that strawberry bed. She went along, too; it looked weedy and ragged; the plants all trampled down — the worst looking spot on the place.

" 'Now, Mary,' says he, 'you tell Murphy the first time he comes here to work, to spade up these strawberries and sow a pound of lawn grass seed on this spot of ground.' And Mary says since that they've bought all their strawberries and there's been no grumbling about the price."

"That's rather discouraging," said I.

"Why, be you thinkin' of having a strawberry bed of your own? Cause if you are, I'll tell you a secret worth knowing.

"You can't grow berries on Fourth Lake ridge, without you warm up that stiff, clayey soil, so you get a load of black sand from over by Third Lake, and besides make the ground as rich as you can, and see if you don't succeed pretty well."

My friend would have talked an hour longer, but her husband drove up to the door and called out to her that his horses wouldn't stand a minute, so all I could do was to thank her and hurry her off. She has promised to give me strawberry plants next August or September.

These two experiences, widely differing — each one, perhaps, an extreme case, teach us, it seems to me, two lessons.

1st. That the oft-repeated saying of the advocates of the so-called "new education," "we learn to do by doing" is illustrated in no branch of industrial pursuits more forcibly than in horticulture.

2d. We are emphatically reminded of the truth of the old adage: "If you would have a thing well done do it yourself. You must not leave it to others."

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## BEST SMALL FRUITS FOR WISCONSIN.

By I. N. STONE, Fort Atkinson.

There is certainly an increasing desire among the farmers and those who own even a few rods of land in Wisconsin, to grow a home supply of small fruits. There are those, too, growing small fruits for market who are striving to place in the market fruit that will not only be attractive in appearance, but fruit which will be satisfactory to the consumer in every respect. The small-fruit grower often finds himself at sea when he undertakes to select plants from the many varieties now in cultivation.

We should select those that are hardy enough to stand

our climate and, at the same time, will produce at least a fair crop of fruit of good quality.

We already have tested varieties of different kinds of small fruits which combine these three very important qualities. It is true the small-fruit crop is sometimes lessened on account of drouth, insects or frost, but by careful comparison I conclude not oftener than other crops grown in our state. Still there are many who are well situated to grow a home supply of small fruits that will not make one effort, discouraged perhaps by the failure of some one who has been experimenting with some *worthless* variety.

I have tested over fifty of the leading varieties of strawberries which have been before the public during the last fifteen years, and I find no real value in nine-tenths of them when I compare them with the more reliable varieties we have among them.

We still find the Wilson being more extensively grown for market than any other variety, and I have no hesitancy in saying that if I could have only *one* variety to grow for market, I would take the Wilson, as it is self-fertilizing, productive, of good color and fair quality, good for near or distant market, and succeeds on any soil. It will fruit well on very rich soil and still retain its good qualities for shipping and flavor; while the Crescent and some other varieties if grown on very rich soil lose in firmness, color and flavor. The Crescent excels the Wilson in some respects, being earlier and even more productive, with a stronger plant, and less liable to rust and injury by frost; but it is not firm enough to ship over one hundred miles, and requires a staminate variety to be planted by its side. It is a good companion for the Wilson, and by having these *two* varieties with *even fair* cultivation, a good crop may be expected. By adding the Longfellow and Manchester a good succession will be obtained covering the entire strawberry season. The Longfellow is a late staminate variety, a strong growing fruit, large and of excellent quality. The Manchester is a late pistillate variety, producing fruit of good quality, though rather soft for shipping; but it is growing in favor for a home market.

If more varieties than the Wilson, Crescent, Longfellow and Manchester are desired, I would recommend Piper's Seedling, Old Iron Clad, Atlantic and Mrs. Garfield, as being among the most promising of the newer varieties.

We have a new list of black raspberries, which have come into general cultivation within five years, and it is well we have them, as the old varieties have become diseased and are no longer to be relied upon. The Souhegan, Tyler and Gregg will give a succession of black raspberries during the entire black raspberry season; each variety is hardy, productive, and bears fruit of good quality. There are no better varieties tested, for a succession of this desirable fruit. Fruit growers who are growing extensively for market, will find it an object to add the Ohio to the above list, as its season is medium and it will help to keep the supply of fruit full between the earlier and later varieties.

The raspberry season would not be complete without a good supply of reds. The Turner and Cuthbert, for home use and near market, and the Brandywine for distant shipping, will give an assortment which will cover the entire red raspberry season; all are of good quality and perfectly hardy.

Those who prefer a tart red raspberry will find the Shaffer's Colossal much better than the Philadelphia in every respect. It does not send up suckers, but increases like the black raspberry—from the tips. It is very productive, hardy, and needs plenty of room; should not be planted closer than  $3\frac{1}{2}$  by 7 feet. It is not firm enough for shipping over 50 miles. The Marlboro seems to be the most promising of the new red varieties.

Blackberries are being quite extensively grown in Wisconsin now; Stone's Hardy and Snyder without winter protection, and the Ancient Briton with winter protection, are the varieties in general cultivation here. They are undoubtedly the best in cultivation for this latitude.

The following varieties of grapes are among the best that are succeeding here: Worden, Concord and Moore's Early, Lady, Brighton and Agawam. The Prentiss, Pocklington

and Niagara are promising new varieties, which are being tested here. The impression seems to prevail that currants cannot be grown successfully in Wisconsin, on account of the currant worm. We cannot afford to be deprived of this valuable fruit when this insect can be so easily destroyed. The Red Dutch for early and Victoria for late, are the reliable varieties in general cultivation here.

The Fay currant is the most valuable red variety in cultivation. It seems to do well wherever planted. It has made slow progress in its introduction into this state because of the high price of the plants; but on account of the size and quality of the fruit and its great productiveness, it will come into general cultivation here as soon as the price of the plants is within the reach of the masses.

There are but few gooseberries grown for market in our state; still we find them quite extensively grown for home use. The Downing and Smith's Improved are considered the best varieties for general cultivation.

Fruit growers are often asked the question, Which is the best cherry for Wisconsin? Well directed efforts have been made to grow the leading varieties which are a success in other states, but as yet they have proved very uncertain here. We have an unnamed variety (as far as I know) being grown more extensively in the vicinity of Lake Mills than elsewhere, which is the most reliable variety we have. I do not know its early history, but during the last ten years, in which I have observed it, it has not failed to produce a good crop, except when a late spring frost has killed the fruit. The trees grow from the sprouts and produce the same kind of fruit as the parent tree; it is as hardy as an oak, a prolific bearer; fruit of medium size, bright red and of good quality; season medium. I do not know that any nurseryman is propagating this variety for sale; but I am confident it is the best cherry, all things considered, we have for this state.

The varieties mentioned in this paper are among the best of the tested ones in cultivation. Some do better in some localities and on certain soils than others, but this can only be found out by trial.



## GRAPE GROWING FOR FARMERS.

By C. A. HATCH, Ithaca.

The fruit of the vine is something that few of the human family do not admire. The vine has been, from the time of earliest history, the emblem of home comfort, and the vine and fig tree synonymous with rural independence and enjoyment. Yet we presume not one farmer in twenty of this country of ours has grapes enough on his farm for the use of his own family. And why is it? Is there any lack of soil, or conditions necessary to the success of the vine? It cannot be for lack of the right kind of soil, for grapes will flourish on almost any kind of land, from the poorest clay or sand to richest mould. It cannot be for lack of the right slope of the land, for our many hills and narrow valleys give any desired slope, to be found on almost every farm. Varieties, we have in plenty, and those who have them to sell are anxious to speak well of their virtues. Can it be that our farmers are more willing to "lend ear" to something that has dollars more visible. Cannot they get their ideas off of hogs, cows and sheep long enough to give a little attention to something that will promote comfort, health and prosperity without being sold for the cash? Something that will lighten the cares of the wife, and make home attractive to the younger members of the family, make them healthier, happier and brighter, to say nothing about the satisfaction of one's own self by disposing of a few clusters when coming in for nooning, weary and footsore?

Whether it be for any of the foregoing reasons that farmers do not plant vines, or whether it comes from negligence or an idea that too much skill in pruning and care is required, we shall take the charitable side of the question and say the last reason is the one, and try to make this a practical article. And right here let me say it is a false notion that any great amount of special skill is needed — not so much as to grow tobacco, hops or many other things; but grape growing does require certain things to be done at the right time;

for example, the vine must be pruned in the fall, and *must* be covered in the winter, and must be tied up to stake or trellis in the spring. Some no doubt would ignore all three of these points and say you need not protect in winter, you can prune in the spring, and let them grow on the fence for stake and trellis. A man might grow grapes by not covering them winters; in fact the last season I saw a vine that was heavily loaded that had neither been pruned nor protected nor even tied to a trellis, but this was an exception, not the rule.

The first thing is to get your vines of course. Now when you are at this point one word as to the varieties. Every one knows the Concord, and it has been called "the grape for the million" so long and so often that it has become monotonous; and we think that if any horticultural society were to offer \$50 reward for an essay on grapes in which the Concord was not called the grape for the million it would be safe; the money would be untouched; the essayist could not be found.

The Worden is a seedling of the Concord and has all of its desirable qualities and some of its own; we will say of it a little more than "It is the grape for the million"—it is the grape for the billion, if we are allowed that form of the superlative. The Janesville for earliness, hardiness and productiveness is hard to beat, and these two varieties—Worden and Janesville, are enough for a farmer's vineyard. If you want to try something more delicate in habit, also finer in quality, there are the Delaware and a long list of Rogers' hybrids, but I would say let the specialists grow them; it takes too much fussing for an ordinary farmer, with so much other work always calling for his time and attention. For my own part I never could appreciate them. Perhaps my taste is not cultivated, perhaps I am open to the charge of not being refined in taste, but I always prefer Worden or Concord to any other, for my own eating.

You will likely get two-year-old vines, and now is the time to train them in the way they should go. This brings us to the most important part, pruning; for you must prune your vine so as to start right, for that is half the battle. One vine or

cane to each root is all you want to allow to grow the first season, and this should be cut back in the fall, after the leaves fall, to two buds, from which your next year's vine is to grow.

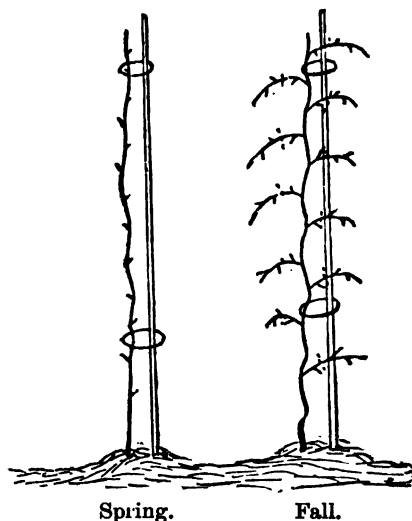


Fig. 1. Grape vine second year after planting.

The next fall cut the two canes back to four feet in length, and if you want to train in the simplest way possible, cut one off the Janesville (Concord or Worden will need the two), and tie them up to a stake; no stakes will be necessary the first year. Your vine is now in regular shape, and each year's work will only be a repetition of the former year's. You now have on the Janesville one vine four feet long, and on the other kinds two of the same length; these will in the fall each have branches or laterals, as they are called, on which the fruit, if any, will be borne. These laterals must be cut back to two buds each, every fall before burying for winter. And right here let me call your attention to a fact not generally recognized, that the vine on which fruit is grown is a bud in the spring, the vine as well as the fruit growing the same season. One hundred and fifty buds are considered the greatest number allowable on a vine, so do not think it destruction if you do cut away nineteen-twentieths of the vine in pruning.

And now you have all that is necessary to raise grapes. As a covering I have used dirt only, put on four or five inches deep, and have had good success.

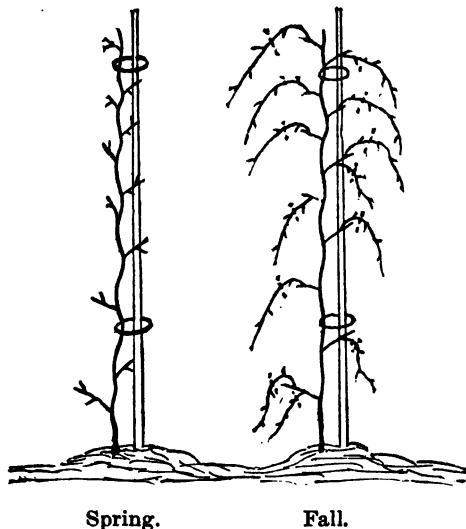


Fig. 2. Grape vine, third and succeeding years after planting.

Some may say summer pruning is necessary, or that an expensive trellis is necessary. I have not found it so, and think summer pruning and trellises of any kind except what is really needed to support the vines, are worse than useless.

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## THE GROWING OF SEEDLING APPLES.

By PETER M. GIDEON, Excelsior, Minn.

Perhaps a few items on the propagation of new varieties of seedling apples would be of interest to many not familiar with the facts or principles governing the production of new varieties from seed; therefore, please indulge me in a short essay on the subject, though in doing it I repeat many items often told, yet new and of great interest to the great mass who desire a better collection of fruit, whether they intend to embark in the business or not.

I began the culture of fruit about sixty years ago, by planting peach seed. Got a good stand and good growth the first year; then dug, reset and cultivated them myself, and had the pleasure of eating fruit from them before I was nine years old, and ever since it has been my chief calling and delight. But our efforts and trials in Minnesota began thirty years ago last spring by planting one bushel of apple seed, a peck of peach seed, and 500 apple, pear, plum and cherry trees, and for eleven years thereafter we planted each year enough apple seed to bring a thousand trees, and in that time made frequent additions to the orchard of old, named varieties—all southern or eastern grown trees and seeds. All were kept as long as they could be made to live in Minnesota, and to-day only two trees remain. One of those, the Wealthy, was grown from a cherry-crab seed, obtained of Albert Emerson, of Bangor, Me., of whom I obtained cions at the same time, from which I grew the Duchess, Blue Pearmain, and the Cherry-crab, all of which combined were the foundation of Minnesota horticulture, that to-day is the pride and hope of the northwest. But since these varieties came into bearing, we have planted only of our own growing of seed, with forty first-class varieties the result. Not large, but each first-class of its size, and none of the forty less in size than Transcendent or Hyslop, and every one better in quality than those, whilst several will equal, if not surpass every known popular variety, whether to eat from hand or for culinary purposes.

And now, having given the results thus far of those that have come into bearing, I will state the process by which those results were obtained. The process was, and is yet, the crossing of the common apple with those varieties that had enough Siberian Crab in the composition of the tree to make of it what we term an iron-clad, and we do this by close planting, that wind, and bees and other insects can the more readily and surely carry the pollen from bloom to bloom—from one variety to another—so as to fertilize the germ of the fruit. The seed so fertilized, we plant, and when the young trees are large enough to set in orchards, we select the best, and then wait to see what the fruit will

be; but it is not every seed that will produce a good apple, for no two seeds will be fertilized just alike, hence no two trees just alike, even from seed of the same apple.

From the same lot of seed we grow apples from the size of a large green pea up to the largest size, and of every imaginable form, color and quality, and the varieties diverge as widely in form and habit of trees as in fruit. Thus far, of those selected and set in orchards, about one in each fifty has given a first-class apple, and for the reason that our seedlings are a mass of mongrels — mongrel crossed in the mongrel — each, perhaps, of a thousand grades, hence the uncertainty as to what we get; yet we have demonstrated that out of a great mass we are sure to get something good. The hardness of the crab has to be retained in the tree, and size, without the astringency of the crab flavor, in the fruit, and to judge with any degree of accuracy as to what class of tree is most likely to combine the sought-for good qualities, requires no small amount of careful observation, through a long series of experimenting, and then we miss far oftener than hit. When we grew the first from our own growing of seed, we set all in the orchard, and later set in orchard about one-sixth, and yearly as new seedlings come into bearing, we develop in knowledge, and as we gain knowledge the per cent. set in orchards grows less. Thus far it has taken from 300 to 500 seedlings to give us one first-class apple, and that from seed taken from the best apples we had; but in the same orchard grew a vast amount of inferior apples, that to a greater or less extent adulterated others, hence, to some extent, the smallness of the gain.

But the conditions in the state orchard are quite different. There nothing but the very best is set, and from it we anticipate a larger percentage of good fruit, though mongrels will cut mighty freaks sometimes in reproduction, and, as yet, the oldest trees from the state orchard seed are only two years old; yet young as they are, many bid fair to give good fruit, and, in fact, our faith strengthens each year as new varieties come into bearing. But the way to determine whether I have adopted the best known mode by which to develop new varieties of good quality adapted to our climate

is to note the results, and the result is more first-class apples in the last fifteen years than have resulted from all other modes put together.

The Siberian cross has given us hardiness of tree, and a combination of qualities not found in any other class of apples, whether to eat from hand or made into sauce—for either use we can match the world, and, therefore, I hold the Siberian crab to be a Godsend to the entire North.

The object of the state orchard is to grow from seed new varieties adapted to our climate, and especially long-keepers, and to that end we planted close together in rows, with every alternate tree a long-keeping variety, and the other alternates are our best iron clad seedlings—the one to give hardiness and the other long keeping. In the cross we expect to get some combining hardiness of tree and long keeping fruit of good quality, a treasure we have not yet got, and to get it we top-graft long keepers on hardy seedling stocks that get their growth early and stop their sap flow, thus compelling the later-growing more tender variety on top to harden up for winter, and thereby produce and give us the cross, which could not be done were the long-keeper on its own tender late-growing roots. And even on the best of stocks we find but few long-keepers that can be made to stand and give fruit, and none that are hardy enough to make a permanent tree; and only about twenty out of one hundred bid fair to some day yield fruit—as yet only a few samples have been had from any long-keeper. The cross is made in the bloom, the pollen of the ironclad being infused into the bloom of the long-keeper, and the seeds from the long-keeper thus impregnated are planted, and the young trees that prove hardy and of fair appearance are selected for fruiting.

We have, by careful and repeated plantings, demonstrated to a fact, that the seedling will ripen its fruit at or near the time the parent apple did from which the seeds were taken, no matter what crossed with, nor how closely it partakes of the male parent in the tree and quality of the fruit. In our many trials we have solved the problem what to do and how to do it, and now, with the state orchard set to our notion,

we are fairly started on the road to sure success—to make Minnesota a great fruit-growing state.

The state orchard was set six years ago last spring with root and crown grafts—no material difference in their growth—and to each was set a stake to mark its location; and at this date we have had three crops of apples from it, and the seed of all was planted, the last crop being about seventy bushels of the very finest of apples. So taking the success of the past as a criterion of the future, we may reasonably expect not far in the future to number our first-class varieties by hundreds, and in succession the year round. And, in conclusion I will just add, that many seedlings on our own grounds bore this year (1884), for the first time, but as seedlings do not always prove true to their first crop, we neither name nor send out until after the second fruiting, therefore but few varieties can be had before next fall, at which time we hope to have a full supply of all trees of the best varieties.

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## THE PRACTICAL ASPECTS OF FUNGOID PLANT DISEASES.

By A. L. HATCH, Ithaca.

At one time we had in our nurseries fifty kinds of crab apples and hybrids. We expected and predicted splendid results from them on account of their extreme hardiness and early and profuse bearing, as well as their beauty, richness, and usefulness of fruit. Our brother nurserymen as well as ourselves were enthusiastic over these varieties and a wonderful number of new sorts were brought out and disseminated throughout the northwest. They have not, however, met the general expectation of success and it is meet and proper that we should learn the cause.

We often note the general failure of one or more kinds of common apples and quite as often learn of splendid success in some localities. Disaster and failure sometimes follow large plantings when a few isolated trees would seem to



point unerringly to certain success and sure returns for larger quantities under the same conditions. The subjects of local climatology, of soils, of subsoils, and exposures for orchards have all been considered more or less in horticultural literature and still one universal influence has been scarcely noticed by popular writers on fruit topics. Indeed many of its practical features need investigation at the hand of scientists, who have apparatus, skill, and facilities not possessed by common fruit growers.

After several years of experience and observation we are satisfied that parasitic fungi in the form of mold, rust, scab and rot have injured fruit culture in Wisconsin more than severe cold has. They are the precursors of winter-killing, even of hardy varieties, by their weakening powers; and their direct attacks upon fruit in the form of scab and rot cause losses of vast amount.

Fungous growth is so radically distinct from that of ordinary vegetation that it stands as its opposite in nature. Such plants as we grow on the farm or in the garden, indeed all our useful plants, with a few exceptions, derive about all their structural growth from the air, and this growth is connected with the absorption of carbonic-acid gas by the leaves. Water and mineral matter and nitrogen only are derived from the soil. There can be no growth of these plants without leaves to absorb carbonic-acid gas from the air, that they may appropriate its carbon to form cells, starch, sugar, etc., that make up the plant structure or its fruit. Fungi make their growth by absorption of carbon through their roots — or rather what serves as roots in these plants. Whatever they grow upon, whether living or dead, is changed by their growth. The carbon of economic plants, whether in the form of fibre, glucose, oil or other substance, is devoured by these greedy roots, while the outer portions give off into the air carbonic acid gas. Thus we see fungi are the antipodes of common plants, absorbing by rootlets instead of leaves, giving off carbonic acid into the air, and living upon the very life of plants.

One form of fungus, apple scab and leaf blight (*Fusicladium dendriticum*) has caused the general failure of our

crab apples and hybrids leaving us only a few really good sorts of the many tried. In some localities Fameuse and Walbridge apples are utterly worthless on account of scabbing of the fruit, and on the leaves of some apples it has proven wonderfully destructive. We have a tree of Briar Sweet crab ten years planted that never bore a peck of apples although large enough to bear five bushels. Some summers it will have scarcely a hat-full of leaves on account of this fungus.

To secure immunity from this trouble our observation points to many possibilities. It is a fact found by microscopic study that leaves and fruit are more or less furnished with a protective coating or varnish-like covering. This is assumed to be either wax or silica. Whatever it may be it is probable that some soils furnish more of it than others and that some fertilizers may also. Orchards in virgin soils or in a rank growth of clover seem to grow the finest fruit and suffer less with this fungus. While isolated trees may succeed in bearing good crops, large plantings seem to develop this troublesome leaf blight. Perhaps when this fungus is fully understood we may find that its method of dissemination and growth are affected by the disposition of falling leaves, by the direction of the winds, etc. Again we shall doubtless find that we must modify our planting and seek thick-leaved kinds well furnished with protective coating for both leaf and fruit. While practical researches should be made by fruit growers and nurserymen we may be assured that it will receive more attention from scientists, notably, in our own state, from Professor Trelease, whose work in this line should receive hearty co-operation.

It is, at first view, unfortunate that science is so buried in technical terms. Its hard names and laborious phrases seem to withdraw it wholly from the realm of practical life. To many it may seem wonderfully intricate and hopelessly complex. Really, however, science is only nature, and nature herself is wonderfully complex. If we look into Professor Trelease's list of Wisconsin's parasitic fungi we shall find twenty-five kinds of *Peronospora* — that terrible fungus that rots our potatoes and spoils our grapes. The

life history of this fearful scourge to vegetation is wonderful as romance, and in its results it is almost appalling. That its spores, like invisible dust, are borne upon the breezes, and fall like a shower upon congenial plants, there to work destruction and death, is only less wonderful than its coming into life from its resting spores in the spring when for a time there appears to be volition in its germs that seem to join it to the lower forms of animal life.

If we look in our gardens, out in our fields, in our vineyards and orchards, we will find fungi in some form to be our constant enemies. On some plants we may find them growing internally, and it is possible that when eaten in vegetables or grain, upon fruit or forage, they may be the active, inciting cause of many diseases. If their growth is upon stalks and leaves, we may find relief in the rotation of crops rather than to occupy the same ground year after year with the same thing, for it is now established that one species of fungus thrives only upon certain plants, not on all.

Another indicated remedy is found in the destruction of tops and leaves affected, such as the burning of strawberry leaves and potato tops. Methods of culture should perhaps be modified. Many forms of destructive fungi seem to begin close to the earth, and high training may not in this case be a bad plan.

We note these merely as suggestions for deeper study. At an expense of twenty-five dollars we have on foot an experiment in this direction in our vineyard, suggested by Prof. Trelease and our own observations. We shall be able to report next fall upon the result, and if successful believe it will open a vast field of progress hardly yet explored.

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## WHAT I KNOW ABOUT ORCHARDS.

By J. S. STICKNEY, Wauwatosa.

My knowledge of orchards, though not large, is somewhat ancient, reaching back some fifty years. Then as now my experiences were an odd mixture of joy and sorrow.

Great sources of pleasure were the red apples that filled

my schoolboy pockets; new cider, direct from the press, was nectar fit for gods; painful and terribly depressing were the applications of the long, lithe apple sprouts.

So in later years, when visions of wealth have loomed up, mountain high, all tendency to conceit or pride has been wisely held in check by a simple codling moth or apple gouger.

Without due regard to the sore places in my experience, your secretary and others have desired to know all about that "Ninety and nine and one" Duchess orchard. Few men talk fluently about their failures, but I will at least give you facts. That orchard of five hundred trees is now some eight years planted, and as far as appearances go, seems prosperous. But as with some children of well-to-do people, the appearance of prosperity may be more the work of outside aid than of its own inherent, self-reliant forces. Coming down to facts, this orchard has for the past three years blossomed and set fruit enough, if matured, to give five hundred bushels annually of marketable apples, while all the fruit worth gathering in the three years has been about one hundred bushels. In size and thrift the trees have been amply able to carry and mature three hundred to five hundred bushels annually.

This is the simple though one-sided statement of facts which has gone forth, carrying with it the impression of failure; now for the additional facts to make a complete statement.

The location of this orchard is a warm, southern slope, on a very retentive, stiff clay, in all respects about as bad as it could be; but at the time of planting no better place was available. Drainage has been sufficiently good to allow of thorough culture.

This land has been much needed for the production of special garden crops, and in growing them has constantly been highly manured and freely worked. This has, of course, tended to free growth of wood and less fruiting.

Fifty, probably seventy per cent. of all fruit destroyed, is the work of the apple gouger. Of this I have no doubt, and I think I can account for his presence with equal cer-

tainty. I have for years fostered and spared — just because they were trees — a multitude of unworthy, worthless apples, fancy crab apples, pet varieties of wild plums, etc., etc. These have annually produced some fruit; some years hundreds of bushels, all of which has matured, fallen to the ground and gone to decay. What more perfect conditions could I have made for the encouragement of the whole tribe of predatory insects?

If others are harboring similar trash, right here is the most valuable hint this paper will contain. I am now grubbing out these worthless trees and do not intend to spare any that cannot show a paying record. After ten more years I shall willingly apply the same test to this Duchess orchard, and I do not think it will have to be grubbed out.

I have not yet spent a dollar or a day's labor in efforts to get more fruit, because the garden products and the extra growth of the trees have seemed full compensation for any shortage of fruit, and I could afford to wait. Very soon now the management will be changed to an earnest effort to get fruit. Active cultivation will cease. No more manure will be applied, except as there are indications that it is needed. Some arsenical mixture will be thoroughly applied, and if that fails, all infected fruit will be hand-picked and destroyed. This last, though laborious and slow, is possible and *sure*, as the gouger reaches full maturity within the fruit. Before severe criticism or the verdict of "failure" is applied, I bespeak for this pet child of mine a few more years of probation.

With this paper in view I have been looking about to see if I really do know anything about orchards, and I "give it up," it is really an uncertain question.

I do some work and spend some money, guided less by positive knowledge than by a sort of blind faith in results. Perhaps I can best illustrate this faith by stating what I am doing.

I last spring planted three hundred apples in orchard — shall add another hundred the coming spring. From this you may infer that I still believe apple growing will pay — but the varieties will amuse you. First come one hundred

Hyslop crabs. Of this variety I have four trees that for twelve years past have paid an average income of four dollars per tree annually. From all others in the list of choice crabs which have received ten years of praise and pushing, no case of really paying returns in ten-barrel lots and upwards has come under my observation. If there are such, their fortunate possessor should report them with exact figures, in the *Western Farmer*. It is a duty he owes to the variety and to his brother cultivators. If such reports cannot be made what further use have we for those crabs? Are they entitled to further probation, or shall we grub them out?

Of my other trees, only Golden Russet and Pewaukee are winter kinds; I know of no others that I think will pay. The balance are showy fall apples — among them Wealthy may be classed as early winter — such kinds as are hardy, productive and will handle well — keeping one to two months, long enough to pack and transport them to some ready market. Whether this selection is “wise or otherwise” will more clearly appear some fifteen years hence. If I am here I shall be glad to report.

You will readily see that this orchard is a commercial one, dollars and cents being the only aim. To furnish the most acceptable home supply, regardless of cost, the selection would be a different one, considerably more varied. In this selection, however, scarcely two planters would agree, so suggestions are useless.

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[The following clipping, from *The Country Gentleman* of January 15, 1885, has a direct bearing on the subject under discussion:

“By the discussions on orcharding in the Chemung valley, as reported by the *Elmira Husbandman*, it appears that the apple orchards are mostly unproductive in that region. G. W. Hoffman is reported to have a fine growing orchard, which has received excellent attention, and after the trees had reached nearly a foot in diameter, and it was feared they grew too fast, it was seeded to grass, reducing the annual shoots to only a few inches in length; yet it still continues

unproductive. The effect of top dressing with manure in causing productiveness is sometimes very striking, and if Mr. Hoffman could try it on a few of his trees it might lead to valuable results. One orchard had never borne a full crop, while another a hundred feet higher, and in the same neighborhood, was very successful, the trees five years after they came into bearing sometimes yielding five barrels to the tree. It was afterwards added that the owner of this productive orchard is a skillful manager, and attends to every want of his trees, which was doubtless one cause of his success. He had between 300 and 400 barrels of fine apples the past autumn, from about five acres of orchard. Young orchards sometimes have their bearing long delayed by too rank a growth; in which case seeding to grass and then *top-dressing with manure* have resulted in the best success. But it is important for those who plant large market orchards, to select such localities as actual trial has proved well fitted to producing good crops." ]

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Mr. Tuttle thought that while good, the Hyslop has reached or passed its prime as a paying market apple.

Mr. Kellogg laid upon the table specimens showing the work of the apple-gouger, the specimen (Golden Russet) being gnarled and dwarfed, of less than one-tenth the weight of fair samples of the same fruit.

The question being raised, Mr. Kellogg stated that the apple curculio was quite as abundant on trees remote from plum and crab trees as on those in their immediate vicinity.

Mr. Witt—Mr. President, after having suffered the loss of a good many hundred bushels of apples by the fellows whose work we see on the table, I have found a remedy. That remedy is somewhat connected with the pork question. About the last of May, hogs are taken from the artichoke field, their noses rung, and they are turned into the orchard. They very carefully hunt up and eat everything that falls. They run in the orchard till they are transferred to winter quarters. My part of the fruit is picked by hand and I have not seen the mark of a cur-

culio or gouger, nor a wormy apple in my orchard for the last three years.

Mr. Palmer reported a greater profit from about fifty Fameuse trees than from the balance of an orchard of 700 to 800 trees.

Mr. Stickney stated that while occasionally perfect, the Fameuse is in most seasons entirely ruined by scab (*Fusicladium*) in the damp climate near the lake.

Mr. Hirschinger thought Mr. Palmer's failure with the Golden Russet was due to the soil on which the variety was grown by him; but this was said by Mr. Palmer to be a heavy soil,—admitted by the members present to be the more favorable for this variety.

On the question of exposure, Mr. Palmer stated that in his experience a west slope was more favorable than an east exposure for trees,—the cold east winds at the period of flowering doing great injury to the trees and flowers.

Mr. Jeffery reported the Pewaukee as discouragingly slow in coming into profitable bearing, in this respect resembling the Northern Spy.

In reply to a question, Mr. Jeffery said that he did not know of a winter apple to plant for profit beside the Wealthy.

The apple gouger was said to affect all varieties of apples, showing no partiality, coming every season and staying always.

Mr. Clarence M. Weed, of the *Prairie Farmer*, stated that in Michigan the gouger was not counted among the injurious species.

Mr. Witt — Mr. President, I have read and heard a great deal on the subject of tender and of hardy varieties of fruit. I have asked a great many fruit-men what constituted a tender or a hardy variety of fruit tree, and have never received an intelligent answer. With your permission I would like to talk a few minutes on this subject.

President Smith — We would like to hear you.

Mr. Witt — The variety of trees that mature their fruit in the fall and afterwards withdraw the sap from circulation, mature and drop their leaves before winter, will be hardy.



The varieties of trees like the Roxbury Russet, the Baldwin and the R. I. Greening, that require a long season to mature their fruit, after the fruit is matured, have not time to withdraw their sap from circulation, mature and drop their leaves, and get ready to withstand the change from fall to winter. Such varieties of trees are tender.

Our long, pleasant, growing fall, and the sudden transition from such falls, to a sharp, crabbed Wisconsin winter, is decidedly against the longevity of our fruit trees.

Mr. Hatch stated that the growth of a tree old enough to bear was nominally determined about the middle or end of July; in his opinion winter killing is the result either of a weakness of constitution, or of a second growth resulting from injury early in the season, followed by a later stimulus.

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### NATURE'S SUGGESTIVENESS.

By MRS. IDA E. TILSON, West Salem.

It is proper that the first attention of horticultural societies be given to practical matters. This is a climate where, for about nine months of the year, a great deal of food and a great deal of fuel are needed. Whatever, therefore, adds to the yield, preservation, and profits of horticultural products, is of great moment. But there is an old saying about sermons in stones and lessons in running brooks. Whoever, then, builds a stone wall without hearing those sermons, or irrigates from a brook and learns not its lessons, has lost something. He who draws from nature's ample store only food for his body, and leaves untouched her equally generous provision for his soul, has missed, at least, half of life. Penn calls the country "the philosopher's library in which he reads and contemplates the power, wisdom and goodness of God." And Tennyson says of one single flower—

" Little flower, but if I could understand  
What you are root and all, and all in all,  
I should know what God and man is."

The horticulturist does not occasionally visit Nature, like poet, philosopher, and scientist. He dwells with her. Every day he may be a reader in her library, every day a learner in her school. He may continually feast his soul on her divine truths, and find that farm and garden work, usually considered as drudgery, presents its own noble opportunities for culture.

He who studies nature, sees her operations are not left to chance, but everything is done in law and order. The earth does not come in collision with comets, nor do stars fall upon it. The sun never forgets to rise, nor the moon to give her timely light. Even comets are known and catalogued. The seasons — summer's heat and winter's cold — forever follow in their turn. Men have not gathered grapes from thorns, nor figs from thistles. As a little poet among the Berkshire hills sings,

“The dimpled swells of fertile plains,  
The boughs of trees, the roots of flowers,  
At least are always here;  
For Nature keeps her sacred powers

All 'round the year.  
If, through the ceaseless round of change,  
One changeless Will appear,  
Unmoved, undaunted may we range  
All 'round the year.”

Only at rare intervals do earthquakes, hurricanes, and pestilence remind men of the fearful forces within this globe, from which its dwellers are protected by untiring love and care. And recent researches confirm the belief that such phenomena are themselves subject to law. T. Starr King, considering these things — possible earthquakes, famines, and other calamities, thought one might as well live in an uncaged menagerie, as on the earth, if it were not controlled by God.

The same nature which suggests law, also incites to obedience. That system of affairs which exists for man's benefit, is not suspended at his pleasure. Fire inevitably burns one. Exposure and gluttony ruin any constitution. If the husbandman lets his seedtime pass without sowing,

the whole year is lost to him beyond recovery. "Time and tide wait for no one."

But proofs that the head of the universe rules in love are manifold. There are medicines for diseases, friends to set over against enemies, and means of defense. Sunshine is a panacea, and mineral springs furnish compounds ready-made. Gardeners find the friendly lady-bug pursuing the destructive potato beetle. Man has wisdom, the serpent has cunning, and deer are fleet. Many lizards have power to take on colors of leaves, flowers, and other objects around them, changing rapidly from green to brown, drab or violet. Others, living among rocks, have dull hues, equally protective. The ermine's snowy winter coat and summer brown suit, contribute another exemplification of compassion in Nature's Ruler.

Life is indeed sweet to men, and a future life their dearest hope. The natural world presents many changes analogous to death and resurrection. Winter's bare, brown trees give no hint of life deep hidden in sap and roots, till they revive in spring. Who could predict the worm would come forth from that death-like sleep in its cocoon, a gorgeous butterfly? Who could guess that an egg held within it, beak, talons, and wings, the future bird, destined to soar and sing in the clouds? Or who would, in bleak winter, imagine the flown birds nesting under southern skies? Who would suppose the helpless infant could, in time, become a man, strong and wise, traversing wide seas, chaining steam and electricity? That a higher form of life has ever succeeded a lower, is written on earth's very rocks. In the words of St. Paul: "That which thou sowest, thou sowest not that body that shall be, but bare grain, it may chance of wheat or of some other grain. So also is the resurrection of the dead." Of like import is this apt and beautiful expression from Victor Hugo:

"The tomb asked of the rose:  
 'What dost thou with the tears, which dawn  
 Sheds on thee every summer morn,  
 Thou sweetest flower that blows?'

"The rose asked of the tomb:  
    'What dost thou with the treasures rare,  
    Thou hidest deep from light and air,  
Until the day of doom?'

"The rose said: 'Honey of night,  
    Deep in my bosom, I distill  
    Those pearly tears to scents that fill  
The senses with delight.'

"The tomb said: 'Flower of love,  
    I make of every treasure rare,  
    Hidden so deep from light and air,  
A soul for Heaven above.'"

Cemetery seems an affectation beside the quaint old name, God's Acre.

The bible is one succession of natural images. God's dealings with His people are more than once likened to the labors of the careful husbandman. In the cloud is still seen his bow, token of an everlasting covenant with man. Nor have the Pleiades yet lost their sweet influences. Christ spake in parables of the wheat and tares, the tiny mustard-seed and the barren fig tree, the savory salt and the pearl of great price. He pointed to his tender care of birds and lilies. He called himself the good shepherd, the morning star, and a well of living water. Scriptural miracles find their best explanation and defense in nature's ever-recurring miracles. Wine made from water, and multiplied loaves, are not unlike the pine-apple growing without roots and feeding on dew and sunshine.

Though Thoreau and Wordsworth are extreme cases of writers that have sought inspiration from nature, great authors are few who have not drawn their best illustrations and images from her resources, and this exclusive of those treating particularly on natural phenomena. Thoreau, you remember, found the pleasures born of sea and sky so many, he resolved to live alone in Walden Wood. He raised his own food, tried what the lower creatures could do for him, and sought to learn life's essential facts. Wordsworth wandered over the hills so often, and at such unseasonable hours, it is

said a common expression with his neighbors was "Wordsworth is out mooning around."

From Bishop Heber down to B. F. Taylor writers have likened man's life to a river flowing into an ocean—the great ocean of eternity. Sometimes this stream holds a lovely picture of the sky and heavenly bodies, frequently a broken and imperfect one,

"As the symbol of love in heaven,  
And its wav'ring image here."

Death, also, is occasionally compared to a river which must be crossed in passing from this land to a heavenly. But more often death is called a sleep, and how similar are the two in their restfulness, continued existence and ultimate awakening! Youth is the morning of life, noon its prime, and old age its evening; or, in a more extended figure, childhood is seedtime, youth a season of growth and labor, followed by autumn's fruitful hours, and winter's quiet contemplation and enjoyment of garnered treasures. And if, surrounded by October's gorgeous foliage, one rarely misses June's blossoms, it is suggested every situation and age has its compensations. Longfellow's description of Evangeline's gray hair might almost reconcile one to growing old.

"Then there appeared and spread faint streaks of gray o'er her forehead,  
Dawn of another life that broke o'er her earthly horizon,  
As in the eastern sky the first faint streaks of the morning."

Men are plants improved by culture. The wheat and tares, the sweet and bitter do indeed grow together for a time.

"See how the lily swims the pool, a thing of grace!  
Though in the mire its root, no stain its fair leaf dims,  
So is the pure still pure, even in an unclean place,"

is a thought as old as the Brahmins. Harvest scenes have been especially suggestive. Some may have seen a bunch of golden wheat laid on a silent breast, or on a coffin lid, beautiful token of a ripe, rich and complete life. Tribulation at first meant threshing, from the Latin "tribulum," a roller or thresher. The deeper, religious use of this word

was unknown to heathen classical authors, and belongs exclusively to later and Christian writers. Not until the grain is separated from the straw and chaff, hardly before its hull is torn away in the mill, does the full value appear. In tribulation, men by dropping worldly treasures and petty conceits, reveal their inmost worth. Like Ruth of old, may not gleaners yet find precious sheaves of truth and memory

“In the harvest-field of time”?

Men are fond of imagining themselves strong oaks, and women, clinging vines. The youth, when he wishes to describe his sweetheart's grace and beauty, calls her eyes blue as violets, her cheeks like roses, and her lips coral. He cannot do otherwise, for Shakespeare puts no better words in the mouths of his lovers. Every child has been reminded, time and time again, of the busy bee.

Images of sorrow and desolation are of great variety. Truly men are not always at their best, for birds cannot always sing, nor flowers perpetually bloom. And the skylark, cloud-bird though he may be, with his home in heaven, has his nest on earth. A friend lately spoke of the shadow of a great bereavement in which he felt he had walked for years. Life has many rainy days. The last of a family is the last leaf on a tree. Jean Ingelow's picture of an empty home-nest, after the birdlings have flown, is familiar to all. Frost breaks up mighty rocks, which, in their gradual wearing away, typify the disintegration of fortunes, states, and old institutions.

Nature undoubtedly has as many bright as sombre phases but man, “born to trouble,” takes apparently less note of them, and the lambs, birds, and spring, really beautiful and joyous, have yet been made to do double duty.

There are many old adages and mottoes, of such a miscellaneous character, they cannot be grouped round any one central idea, which, used daily without any thought of their origin, will, when considered, prove to have been suggested by Nature. “Coming events cast their shadows before.” “Distance lends enchantment to the view.” “The shadow of a shade!” “Make hay while the sun shines.” “Straws

show which way the wind blows." "Still streams run deepest." "Wisdom is better than rubies." "A honeyed speech!" "Little foxes spoil the vines." "As snug as a bug in a rug!"  
Some of them in rhyme are,

"As brave as a lion, as spry as a cat,  
As plump as a partridge, as blind as a bat."

In this connection might be mentioned the seals of the states, whereon, besides implements of war and art, appear those of agriculture, together with the pine tree, the badger and the eagle.

Nature is not only a commentary on man's life, experience and character, but to some extent, also, a dictionary of single terms. Capricious is from 'capra', a goat. Accordingly the movements of a capricious person can no more be counted on than those of a goat. Rivals were originally dwellers along the same river. Experience, however, has proved water courses frequent causes of contention. Many cities and countries have had their names suggested by natural features of the localities. Bristol means a chasm, referring to that through which the river Avon finds its way to the sea. Buena Vista is a good view; Buenos Ayres, good air; Blair, a plain; Strathmore, a broad valley; Delhi, a quicksand; Roanoke, seashells; Chautauqua, a foggy place. Cambray means caverns, referring to those in which the inhabitants used to hide their goods for safety. Pawtucket suitably means at the falls; Pomerania, on the sea; and Poland, flat land. Capri was once noted for its goats; Marmora, for its marbles; the Azores for their hawks; and the Madeiras, when named, were wooded. Jamaica should be a land of springs, and Florida a land of flowers. All Margarets should be pearls, and Auroras fresh as the morning. Susan, in its original tongue, meant a lily; Esther, a star; Rhoda, a rose; Dorcas, a gazelle.

Nothing if not practical, is a favorite utilitarian measure of merit. Nature, happily, has done as much for art as for literature. Man but weaves the silk, linen, cotton and wool which nature provides. He tempers and moulds the metals

she furnishes. Musical instruments were probably invented from a desire to imitate human voices and songs of birds. There is a tradition that Beethoven's Moonlight Sonata was actually composed under moonlight's bewitching influences. Ruskin bids painters paint nature as it is around them. The Greeks brought sculpture to perfection by making nature in her most perfect forms their models. Is not landscape gardening an imitation of her best phases? It is a general rule that no element shall be introduced into parks, which is not natural to the soil and climate. The cave is the type of Egyptian architecture, and interlaced boughs of trees suggested the Gothic. Before ever an arch of masonry was built, there was an arch of the human foot. Hinge joints in elbows and knees, ball and socket joints in hips and shoulders, serrated and beveled edges in craniums, ridge and groove joints in noses, preceded all carpentry and joinery. Among mechanical powers, all three kinds of levers are found in various parts of the mechanism of the human body, and in that of the lower animals. Dr. Hogeboom thinks that the inclined plane was naturally suggested from the advantages offered by slopes of hills. Hand, foot and span are all natural measures. The digits were doubtless once counted on the fingers. Lenses in all their modifications, telescopes, spy-glasses, opera-glasses, cameras, spectacles, are still on the plan of the human eye. A large number of animals bathe themselves, as elephants, deer, and birds. Those suffering from fever restrict their diet, keep quiet, seek dark and airy places, drink water, and sometimes plunge into it. Those afflicted with rheumatism, keep as much as possible in the sun. In view of a great number of such interesting facts, Delaney, the scientist, thinks hygiene and therapeutics as practiced by animals, may, with advantage, be studied in the interests of human physiology and medicine. Ants, bees, rats, and even buffaloes, have well organized and efficient governments. The young and wounded are tenderly cared for, but no drones nor tramps are allowed.

Nature having thus suggested or confirmed so many of man's religious, literary, and scientific conceptions, cannot, of course, leave unaffected his character. Dwellers among



mountains as steadfast as their own hills. Are not the orthodoxy, firm parental government, and industry of New Englanders and Switzers known world-wide? Is it not equally patent, that they who live on the great open plains of the West and by its broad rivers, are cordial, hospitable and generous?

Nature being that great school whence a whole world draws much of its education, cannot the horticulturist, while choosing and pursuing his practical avocation, imitating nature's distribution of seeds and care of plants, at the same time catch somewhat the spirit of poet, artist, and philosopher?

In conclusion, no one brief essay could be expected to exhaust a subject of such magnitude. In some of the illustrations and quotations, an entire separation of Nature from art and science, could only with difficulty be made, and was not attempted. No merit of invention is claimed for this production. Nature's suggestiveness has been recognized by all ages and writers. But these suggestions have been arranged in my own way, around my own ideas. The aim has been "*non nova, sed nove*," not a new origination but a new presentation.

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## SHADE TREES AND FLOWERS.

By MRS. ANNA BRIMMER, Richland Center.

The true home is a place of love, liberty and repose — yet to those who love the beautiful of nature, no home seems quite complete without its shade trees and flowers. So general has this love become, that people of taste who live in cities and towns, never fail to admire a home with such surroundings. The pleasures and benefits of the floral world are enough to commend its culture to all. And happy is the man who finds delight in nature, who sees and is moved by beauty in trees and flowers. He is happy, for the source of his enjoyment is ever varying.

He that is wise, and would be well and happy, if as yet he has no garden, will not allow another year to go by without

putting himself in the way of having one. It is the flower garden adjoining your door, from which you gather the greatest pleasure.

Here, you, yourself have seen to turning down the sod, have planted the seed, set the plant and waited for its blooming. The beauty of arrangement is the work of your own hands which makes it far dearer to you than if it were done by the hired hands of others. You were not afraid to soil your hands with the rich brown earth.

If trees and flowers add so much of beauty to our homes in town, would not a country home among all these become a gem of beauty? But the beauties of nature are largely unseen and unstudied, by the majority of farmers. Those who live in the midst of rural scenes are too much occupied with hard labor to appreciate and use what is about them.

It is a truth that cannot be denied that we all find time, more or less, to devote to the things we love. Still the farmer's wife may love flowers and think she has no time to plant and care for them; but as to shade trees, they take so little time and care, plant them in every corner, at the front of the house, at the back and on the highway along the border of your grounds.

I know of some homes in the country, that stand with bleak, bare walls, a lonely emptiness of door yard, not a tree or shrub near to turn the burning rays of the sun in summer or catch and stay the cold piercing winds from Manitoba in winter.

We need trees for shelter; but is that all? As to the question do they pay, put that thought away. The value of shade trees cannot be settled with figures; it is beyond that.

Let me ask you, do they not make a home happier or better? Does not the caring for shade trees and flowers lighten the labors of life, and ever make the home dearer where they grow?

Many of us can look back upon a childhood home surrounded by trees that towered aloft, whose branches clasped hands and flung a network of sunbeam and shadow across the threshold. It was those trees that brought the uncaged birds with their wild, free notes. It was in those trees you

learned which was the blue-bird, which was the robin. Do not those trees seem like old friends? Did they not play a part in your bringing up?

The planting of shade trees and flowers will not be a benefit simply to yourselves; it is a gift to your neighbors,—to those whose happy windows chance to overlook it,—to those who come in and share what they can of its delights with you. The women and children as they pass, the dusty traveler as he drives by; all look and admire the nodding flowers and the cool, inviting shade, all grief, care and trouble forgotten for the moment. Perhaps noble thoughts have been suggested; surely, no evil ones.

If this be true, then, for the refining influence alone, is it not a duty as well as a pleasure to plant trees and flowers?

The love of home is in every heart. Let us foster and cherish that love by beautifying our homes with those silent teachers of the beautiful. And once more, remember it is not for ourselves alone.

For the children plant the pansy. Every child loves these flowers. They are pleased with the pert, intelligent look of the flower. One day last summer a little three-year-old, noticing a bed of pansies, cried with delight, "Oh mamma, see all the little cats looking at me." Those pansies were a world of pleasure to the child.

Many are apt to indulge in the mistaken idea that to make our homes beautiful requires a great outlay of time and money. Not so. A little money, taste, study and observation will produce the result.

The number of trees planted should depend upon the size of the grounds. Give to each tree room to perfect itself. We are apt to plant too many varieties in too small a space, which in time gives our grounds an uninviting appearance. This comes from want of forethought. The future growth of the tree has not been considered.

Some one has said, "He who plants a tree erects a life." Does he not also erect a monument that will be far loftier and grander than any chiseled stone that may hereafter mark his final resting place?

## FLOWERS IN THE HOME.

By MRS. ISAAC CLARK, Galesville, Wis.

When the beautiful flowers add so much to the happiness and refinement of our homes, why is there a home without them? There must be reasons and also remedies for these lacks. To acquire a knowledge of the one and apply the other, is worth our utmost exertion. Let us look directly at home and see if we have done all in our power to do, holding ourselves responsible for whatever is less than it should be.

Many say, "It is too much trouble;" a few, "I have no room;" others, "I have no time;" and some, "Flowers are an extravagance I can not indulge in." Too much trouble! What is better worth a little trouble than to brighten and refine a home with the ornaments of nature? No room! In this grand western land where ground is so free in its breadth and length and so cheap in comparison to the land in the eastern countries, it would seem that the "no room" excuse could only be cited by the incorrigibly lazy. The "no time" excuse seems so perfectly absurd. Fifteen minutes a day is sufficient time to keep several flower beds in good order, if attended to with regularity and judgment. Who does not pass fifteen minutes each day less profitably? I know that some things must be crowded out of the possibilities of accomplishment in every woman's case. Let us see to it that it is not the best things that we let go. If we would consider that upon us depends, in so great a degree, the cultivation in those about us of refined tastes, and the lifting up of life into something higher and nobler than the mere doing of life's drudgery, we would exhaust less strength upon those things which are of less use to us and of so little value in the work of uplifting the little ones entrusted to our care. How many of us, women — over-worked women, too — whosay we have no time to devote to the cultivation of God's lovely gifts, flowers, or to spend with our children amid the marvels and

loveliness of nature, will patiently sit, hour after hour, stitching little pieces of calico or silk together to make some novel design in patchwork! Very likely as long as agricultural fairs will offer even fifty cents as a premium for such work, many women will be induced to spend their time thus foolishly.

A more valid excuse is the expense. To have flowers, something more than trouble, room, or time is needed. As soon as we attempt to prepare a piece of ground for flowers, wants present themselves. Where are the roots, seeds, plants, and cuttings to come from? We have no money. The earnings of the farmer must, in many instances, after the bare necessities are bought, go to purchase the means of making the farm more productive or labor more profitable. To be sure the old time lilacs, snowballs, and the pretty pæonies, the sweet cinnamon roses, and many others are easily procured and repay, with gratitude, the care bestowed upon them; but these are soon out of bloom and we have no flowers with which to brighten our own rooms, or the rooms of an invalid friend, or to send out on any mission which God has designed for the flowers, and which it is a pleasant privilege of every floriculturist to further. And then, too, the humble country girl that has had an occasional glimpse of the lovely flower gardens in the neighboring town, has the ambition and desire to have as pretty a one; and such a garden would do much towards making her rural home a desirable home for her and her brothers and sisters.

Did it ever occur to any of you ladies in the city who have so much time and means to devote to the cultivation of flowers, that amidst all your charitable deeds this matter is overlooked? Have you ever thought how much good you might accomplish in saving seeds each year to distribute to those unable to purchase? How much happiness could be shed abroad by giving your surplus plants, cuttings and bulbs to the enthusiastic lovers of flowers, who are unable to procure the choicest of God's ornaments! Many of you, no doubt, do give; but have you reached any of the poorer classes living in rural homes? Do you ask how this can be done? If you insert an article in any of the papers to the effect that

you have a surplus quantity of seeds, etc., to give to any one unable to purchase, I am sure that an opportunity will be afforded you for giving them all away, and you may thus increase your power of good. If only the spirit of the flower charities of the city could extend into the country, it would bring to the rural homes a new and delightful pleasure, and all participants would not only help others, but would add usefulness and happiness to their own lives.

Winter-bound as we are, for more than half the year, it affords a great amount of happiness to have a little summer gladness in our homes. When the skies are lowering and the winds fierce and torturing to the world outside the house, what a charm then is a window of plants, or even a green spray that leans and nods toward every gracious influence! How sweet and dear is the unfolding of a single blossom that comes forth under our own care, while all its comrades are asleep in the ground outside! It greets us with cheerfulness and beauty, giving us sweet assurance that we have not had our trouble in vain. The presence of flowers refines, beautifies and sweetens life. They do much to develop the love of the beautiful, good taste and order of the children of our homes, and with their refining, elevating influence, will ever lead them upward to the great Creator.

Of all earth's flowers, the children, "the flowers of our household," should receive the tenderest cultivation and care. The first few years of their life are spent almost exclusively in the home with the home surroundings. Their strongest impressions are made in their younger days. It is in the tender years of the child's life that the disposition is formed. Its mind is perfectly void until it has seen an object, then thought comes into action and that thought leaves an impression on the mind. Each day some new thought of sin or of purity is born into the tender heart and that thought lives forever. How necessary, then, that the surroundings of our little ones should be of the purest kind, of a character to tend towards ennobling and refining the child's nature! O, mothers! if we could only cast aside all cares and troubles when we approach our little ones, and let the sunshine of cheerfulness shed abroad into their tender

little hearts and inquiring minds, how many more genial and sunny natures would be developed in this world. A pope once said could he have all the children under his care till they arrived at the age of five he would have all Catholics. This may be a strong assertion, nevertheless it is true to a high degree. This being the case, if we give our little ones the right training and surroundings till they are old enough to go from us to the schoolroom, we will have less cause to tremble for fear of contamination.

The influences of a happy childhood will never die. Its pure, simple, earnest joys become wells to draw from, whenever we sit down in thirst and weariness by the dusty highway of life. The sunshine in those days reaches across our short stretch of life and mingles its rays with those that beam from the heaven of our hope. The indigestible material which we lay up in the receptacles of our memory in so great an abundance we appropriate to the refreshment and nourishment of our own souls as we live over and over again the past. How sad life must be to the one who can never turn back to the memories of his childhood with a happy heart! What must be the fate of his parents or guardians?

Many a child goes astray, not because there is a want of prayer or virtue at home, but because home simply lacks sunshine. A child needs smiles as much as flowers need sunbeams. It needs neat and tasty surroundings as much as they need the enriching qualities in the ground where they are placed. Children look little beyond the present moment. If a thing pleases them they are apt to seek it, if it displeases they are prone to avoid it. If home is where faces are sour, where fault-finding is in the ascendant, where scolding is frequently indulged in, where the surroundings are not pleasing, rest assured they will spend as many hours away as possible. If we would have them attain to a great perfection of mind and character, it behooves us to try to be happy; to look happy; to talk to our children, especially the little ones, in such a manner as to make them happy; to furnish them with pleasant surroundings and healthful reading; to occasionally stop by the wayside of life and exchange tokens

of affection. These little haltings in the march of life will not only do much toward germinating the noble qualities in their character, but will keep us young and sympathetic.

Children are imitators, and the best manner to teach them true politeness is to be polite to them. The best way to keep them from forming bad habits is to refrain from indulging in bad habits ourselves. There is food for thought in the story that is told of a young lad, who for the first time accompanied his father to a public dinner. The waiter asked him, "What will you take to drink?" Hesitating for a moment, he replied, "I'll take what father takes." The answer reached the father's ears, and instantly the full responsibility of his position flashed upon him. In a moment his decision was made, and in tones tremulous with emotion, and to the astonishment of those who knew him, he said, "Waiter, I'll take water."

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### THE RELATION OF POULTRY TO HORTICULTURE.

There is an old newspaper joke, which claims hens, like plants, are set, and eggs resemble roses, being propagated by layers. This paper, however, proposes to treat its subject in real earnest. Neither horticulture nor poultry-raising requires large capital. A little money buys many seeds or fowls. Either business is most practicable on small areas. Poultry cannot range like stock. A few acres of fruits and vegetables, with their constant weeding and cultivation, are equivalent to the demands of a whole farm planted in coarser crops. It is therefore surprising that he who has a small capital, a small farm, or both, does not oftener combine two such harmonious industries. When statistics of either business are considered, it is equally strange that men will risk new country privations to secure large farms, instead of subdividing old lands in settled communities, and trying these remunerative employments. A late paper estimates the French eat, on an average, one hundred and fifty eggs apiece each year. In the United States about \$30,000,000 worth are annually consumed. Not long since, some statistician astonished one of Wisconsin's well developed counties by proving its horticultural products had, that season, netted more than its combined stock and dairy interests.

Often two crops, fruits and fowls, can be grown in the same enclosure without detriment to either, but on the other hand, with great advantage to both. If a flock are, in number, proportioned to the size of their run, they will cultivate the ground well, allowing no hard crust to form on its surface, nor weeds to flourish, and will tear apart, pulverize and work up into a compost all sorts of old rubbish. Biddy's

worst enemies admit that she can do that to perfection. Many grubs and insects, conveyed to vegetable quarters and flower beds in fertilizers, are found and eaten. All this while the birds themselves are enriching the land. The guano of commerce not always comes from Peru, but sometimes has its origin in American poultry yards, and is all the better for that, as chemists think no fertilizer is superior in condensed strength to this home-made product. Can earthworms, so praised by naturalists, do more than biddy has done thus far? Then is she not entitled, when warm weather comes, to sit under shelter, so to speak, of her own vine and fig tree? Trees and plants afford a sure protection from hawks. Poultry need shade for comfort, and, throughout the year, green food for health. Undersized and injured vegetables, of all kinds, seem to suit their tastes and constitutions quite as well as sounder roots. What horticulturist hasn't unsalable produce, a dead loss, except as swine or fowls transform it? If this subject were a little broader, agriculture instead of horticulture, the market fowls make for cereals would be an important consideration, also their utilization of screenings, etc. The chemical constitution of a soil is believed to affect the color of their plumage, not so much by direct contact, as through the digestive organs and blood, because they eat not only vegetation growing out of this soil, but more or less earth itself. A variety and abundance of mineral matters produce dark and vivid tints. Lime and phosphorus tend to symmetry of form and vigor in carriage. Ammonia induces sprightliness. Gardens are yearly enriched with fertilizers, both natural and manufactured, which contain these very elements, and such situations cannot but prove favorable to producing high-bred poultry.

Horticulturists wage constant war on insects, and make a large annual outlay for powders and other compounds to destroy these pests. But the New York *Tribune* says: "London purple, Paris green, and other deadly and enduring arsenical preparations may well be included in the black list. It is time honored entomologists ceased to lend their influence in favor of such perilous stuff, which, recklessly scattered as it is in immense quantity, poisons the land and the

fountains of life." The *Rural New Yorker* unites in this protest. Not that any person or many animals have actually been fatally poisoned, but, as in adulterations of sugar, syrups, etc., injury is no less because it comes on gradually and insidiously. Insectivorous birds and animals, on the contrary, are natural and safe allies for horticulturists. Prof. King, of River Falls, who has examined the stomachs of many hundred birds, thinks not more than thirty-five per cent. of the robin's food is fruit, and, therefore, commends this generally distrusted and persecuted bird. As fowls are usually made to fast a while before being killed for market, it is difficult to determine just what proportion insects form of their food. An acquaintance tried, by dissecting a number of sick individuals, to learn the secrets of some mysterious malady visiting her flock. She was surprised at the large number of familiar insects found in the crops even of those partially disabled hens. At least cherries, raspberries and blackberries grow out of reach of fowls, and it can fairly be inferred they destroy less fruit than robins do. Let a few additional plants be allowed for them, and they will save all from overbearing, a thinning out by hand not often being practicable. Moles have many friends, and toads are a regular article of commerce, being imported to England from Denmark at the rate of five dollars per hundred. But moles frequently eat off roots and make unsightly mounds of earth. And finally, in the comparison of merits, domestic fowls cannot fail to outrank wild birds and insectivorous animals, because, unlike all others, they are themselves a source of profit. Here again is reverse action. With insects or some other meat for food, an extra production of eggs may be expected.

A list of such injurious insects as poultry are actually known to eat will add positiveness. A friend has called my attention to the Illinois Horticultural report of 1883, on the chicken remedy for sorghum plant lice, and the Michigan Pomological report, of 1877, on the same remedy for curculio. Not only plums, but apricots, peaches, cherries, apples, pears and quinces are attacked by curculios, hardly a fruit escaping if these insects are abundant. When plums are about

as large as peas, the curculio stings them, making incisions in which she deposits her eggs. Fruit weakened by the gnawing of the grubs which hatch, falls before ripening, but by this time its grubs are ready to pass through other changes.

Prof. Kneeland, of Boston, says poultry running about the trees will devour many larvæ before they can enter the earth. Full grown insects, shaken from a tree or disturbed, remain motionless; feigning death for a time, when possibly they might also be discovered and eaten.

Prof. Sturtevant, of the State Experimental Farm, at Geneva, New York, placed a dozen hens in an enclosure of fifty trees. Only three per cent. of plums were stung, while all outside were ruined. Pea weevils proceed in a similar way with half-grown pods. In a row of peas, where I had discovered these pests, not one could be found after some hens had investigated them, and a fine crop resulted. It is generally admitted that crow-blackbirds and Baltimore orioles devour great numbers of these weevils. So many have actually seen poultry eat potato bugs, especially young bugs, their names would make too long a list, though among them may be mentioned J. C. Plumb, of the *Western Farmer*. Cut worms remain under ground by day, and their only effectual preventive is frequently to dig about infested plants and kill what worms are found, surely a suitable work for chickens; and Secretary Gibbs, of this society, testifies he has had several hundred strawberry plants thus cleared of worms. He also mentioned a neighbor who bought five hundred or more plants from him, and gave his chickens full range among them. They were free from the leaf-roller's ravages, while Mr. Gibbs' own plants, not so cultivated, were injured. Wire worms are often hurtful to wheat and garden crops, including strawberries and potatoes. I cannot please my hens better than by disclosing a haunt of these insects, unless indeed, I gather the worms myself and feed them out in a mass. If the biddies cannot, like Oliver Twist, call for more, they look their appreciation. Snails and slugs are less common here than in European gardens, where, on the authority of Appleton's *Cyclopædia*, they are often too

numerous, and the matter is remedied by fowls. Angleworms, in great numbers, sour or poison soil, and no one of any experience in gardening can deny hens' fondness for them, nor for that famous corn and grass destroyer, the white grub, as well as for grasshoppers, which also become formidable through numbers. Biddy will trudge behind a plow half a day at a time, devouring grubs thus brought to the surface. President J. M. Smith, of the Wisconsin Horticultural Society, is as noted for his fine currants as for his leniency to hens. The late Mrs. Lewis told of a friend in Mazomanie, Wis., whose roses, free from slugs, are a perpetual wonder. Their owner, however, divides all compliments with the feathered helpers. I have seen poultry eat bee, wheat, and cabbage millers, and in fact various others, which I have not identified. This is an important consideration, for all kinds of plants and trees, fruits, grease, meal, clothing, carpets, and furs are subject to the ravages of moths. Any warm sundown, when millers are flying about, young chicks with all youth's enthusiasm, may be seen chasing them. A hen will stand motionless over a cabbage plant half an hour, Micawber like, waiting for a miller to happen along. Such an authority on southern horticulture as Ex-Commissioner of Immigration Dr. S. French, of Florida, expressed to me his high valuation of hens in orange groves.

Training doubtless will avail much. A friend tells of a pet cockerel that came at his call to dig for worms. A hen of mine, Twilight by name, was equally acute. Another, Gertrude, having been fed many wood-grubs, to this day lingers about wherever she hears an axe.

A correspondent of the *Country Gentleman*, in an article which has been widely quoted, rather sneers at the guesswork of those who praise fowls for fruit protectors. I have, therefore, made my statements as definite and minute as possible, and extended my observations and inquiries through more than one season. He has, for instance, repeatedly offered his hens curculios, which they would not eat. That there might be no failure to see them, he laid his specimen beetles on a white plate. Now you are all witnesses that hens are not accustomed to dining on china.



Where one bird would catch the idea of such an experiment, ninety-nine would stand agape at the man's manoeuvres. That I might demonstrate his folly, I have served their favorite angleworms, white grubs and crickets, in style, on plates. Only one or two of my flock, and those known to be especially bright and aspiring individuals, would partake. Insects eaten freely in their own way and time, they are generally too startled to notice or accept when thrown at them. Such is not a fair test, either, for those friendly and helpful bugs which horticulturists do not wish destroyed.

To know positively what animals do not eat, would require an almost omniscient eye. Under a great variety of circumstances, I have known these birds we are considering to pass unnoticed or to refuse the valuable lady bug, destroyer of plant lice and potato beetles. A lady friend, a great lover of gardening, sustains me in this statement. Man can hardly estimate the benefits conferred on him by the little ichneumon flies, which keep in check gall insects, Hessian flies, caterpillars, potato worms and a host of others. But these flies are very rapid flyers, and taken with difficulty. I have never seen fowls attempt their capture, although they are so common. Professor Trelease, of the Wisconsin University, calls the golden-eyed or lace-winged flies too fetid for anything's appetite. Dragon flies, beneficial by destroying gnats and mosquitoes, are also exceedingly swift in their movements, and not only that, but high in their flight. As they frequent pools and aquatic plants, not one poultry-yard in a dozen is so located as to give its inmates even an acquaintance with them. Prof. King unites with Prof. Trelease in a belief that chickens can, from the nature of the case, do no considerable damage to useful insects. The *Gardeners' Chronicle* is not afraid to take the same stand.

Perhaps no one will object to such conclusions as have been reached. It is, however, for her supposed wanton and unnecessary destruction, her scratching up things, instead of cultivating around them, that biddy is chiefly hated. Is not her aim, extermination of bugs, and her injury to plants, incidental or accidental? Her purpose

accomplished, does she ever again disturb the spot? The peas, before mentioned as attacked by weevils, we thought ruined by those hens which overhauled them. They were twisted everyway; some plants nearly uprooted. In a few days, though, they straightened up, took new hold, and yielded excellently. Now, their work done, did our feathered gardeners ever return to them? A fence a yard high knit of coarse carpet-twine, in meshes an inch square, and, at intervals, fastened top and bottom to slender poles driven fast in the ground, is said to make a complete barricade against poultry of any kind. It is graceful, nearly invisible and suitable for hedging in flower beds. Mosquito-bar, though less durable, answers very well, so reports a *Western Rural* correspondent. Mr. Hildreth, of Massachusetts, owner of a large establishment, a farm, six hen-houses, eight hundred hens, etc., finds a movable fence, one lath high, made in sections, keeps them in bounds. Nor when brought up in a garden from the first, are they so likely to do damage as when they are only allowed in now and then, or get in by chance, reminding us of the hungry boy at a picnic. Our hens have access to all the premises, and we have an abundance of garden stuff to bestow on our neighbors, as a consequence, we believe. Undoubtedly, too, there are seasons and occasions when fowls will have to be confined in their yards.

The relation of poultry to horticulture is a worthy study, yet in no sense is this paper expected to be decisive. Its aim is suggestiveness. How much loss and disappointment jumping to conclusions has occasioned in every industry, cannot be conjectured. Hens have been referred to most often because I am best acquainted with them. Ducks and geese are not practicable in every situation.

Turkeys are more voracious, but their crops are fatally tender when young. A clipping from a California paper says: "The wine-growers whose vines are suffering from the ravages of slugs, are employing turkeys to devour these pests. The thing works well. The turkeys like the slugs, the slugs cannot get away, the vines are saved from destruction. The owners of slugs, vines and turkeys are contented.

Turkeys grow fat while thus earning their own living, for one of them is said to destroy more slugs than two men can." A New York paper tells of a farmer who keeps a drove of turkeys, and rents them out to other farmers whose crops are troubled by grasshoppers. They were found, in that section, good to destroy potato bugs also.

Some aesthetic and ethic considerations deserve a passing notice in conclusion. Mrs. R. B. Hayes, wife of Ex-President Hayes, is noted for her exquisite taste. A late visitor to their Ohio home enthusiastically declares she owns some of the finest fowls west of the Alleghanies. Stone deer, favorite ornaments on lawns, seem incongruous unless grounds are large and romantic. A live deer would certainly be out of place in confined areas, and among choice evergreens. A flock of hens in which there is choice of color from black, white, red, yellow, to ringed, streaked and speckled can be made as effective as a flower bed and far more kaleidoscopic. Like man, biddy does not wish to live and die "unwept, unhonored and unsung." No animal responds quicker to application. Let her see she is liked and valued and she rises constantly in the scale of intelligence, is obedient through life, and, after death, lives in the memory of those who eat her.—MRS. IDA E. TILSON, in *Report of Minnesota Horticultural Society*.

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### THE PETUNIA CURE.

Mrs. H. M. Lewis has written pleasantly and suggestively, in the *Western Farmer*, of a discouraged young woman, who, having worse than wasted her substance on doctors and druggists, at last had the good fortune to meet a true friend of sense, who plainly told her she had fooled away time and money enough in this demoralizing atmosphere of medicine, shut out from the fullness and life of God's sunshine and pure air. So floriculture was prescribed as a certain and pleasant panacea.

"Try cultivating the petunia in the highest style of art. Search the catalogues and get the best seeds and plants.

After that prepare the soil; let it be rich mold, and guano. Stir and work it all yourself, and before the summer is over you will be as well as any of us."

In sheer desperation, and with feeble faith, she acted on this hint, advanced by easy stages, and is now healthy and happy, and naturally enough, enthusiastic about the chosen plant which was the agent of her rescue.

First, she obtained the best possible seeds of single varieties; next purchased from the greenhouse young plants and cuttings of double and semi-double varieties; these were put out in the garden as soon as the weather permitted in the spring, and when the flowers appeared, if one of inferior quality was seen it was ruthlessly pulled up. In this way she succeeded in getting only true, free-blooming, brilliant flowers. They showed themselves in many shades of rose-color, brown, pink, purple, crimson, white, dark violet, and three varieties of green—one of them of great size. Some were fringed, others blotched, striped and bordered, while others were covered with a net of purple, green or brown. Some of the flowers were as small as a ten-cent piece, others as large as a hollyhock; and one year she originated four varieties of double ones—one a pinkish flesh color that would have been a treasure had a professional florist originated it. Was it astonishing that scores of visitors came from far and near to see the beautiful flowers that were the talk of the country? In growing these flowers, she, assisted by the bees and insects, slightly interfered with nature's workings. The pollen from one flower was carefully sifted upon the pistil of another, and by thus impregnating some of the flowers, rare, beautiful ones were produced that astonished herself and friends—for a number of her hybrids were entirely new. When the double and single are fecundated in this manner, the result is a double or semi-double one. This is the only way by which seeds can be obtained from double varieties.

A friend who started in the nursery business with one acre of land and now has 400 acres, devoted to all manner of ornamental plants, said in a recent note to us: "If women, and men too, would spend more time in the open air,

with a little light labor, there would be fewer doctor bills to pay. I should not be here to-day had I led an indoor life. Of this I am well assured." — *New York Tribune*.

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### THE TUBEROSE.

During the last fifteen or twenty years no other flower has risen to such prominence nor assumed as great a commercial value as the tuberose. Formerly a florist was content to possess 50 or 100 bulbs. Now each of the leading firms grows as many thousands. When the excitement for cut flowers began to develop this was selected among the first, on account of easy culture, pure white color, delightful fragrance, and favorable keeping properties after cutting. To some people the odor is overpowering, especially in closed rooms, but the demand for the bulbs appears to suffer no diminution, but has increased, if anything, within the last two or three years.

The tuberose was first grown extensively in the vicinity of our large northern cities, but in view of the longer seasons and warmer atmosphere of the south, thousands of bulbs have been cultivated there and shipped to northern markets. It is questionable, however, whether such bulbs are intrinsically better; some dealers claim they are inclined to be spongy and imperfect, although of larger size. American bulbs, for a time, almost drove the Italian-grown article out of the English market, the former affording a larger percentage of bloom, but now they are succeeding so well in Africa, our foreign trade in bulbs has a tendency to suffer in consequence.

The tuberose delights in a deep, rich, light soil, with a southern exposure, to lengthen the season as much as possible, at the north. The occasional early frosts of autumn frequently destroy the flower-buds or the bloom, before it arrives at maturity; hence any assistance we can render our plants to hasten the flowering season is a great point gained. This is partially accomplished by potting the bulbs and slightly forcing them before planting in the open ground, a measure feasible in a limited way, but rather ex-

pensive for the culture on a large scale. Such plants, it is thought, are rendered weakly, and do not, as a rule, yield so large a percentage of bloom as those grown in the usual way. Beginning with the small bulblet or offset, it takes about two seasons to form a first-class or flowering bulb — the third summer usually finds it in perfection, after which it deteriorates, somewhat after the manner of many bulbous plants, as, for instance, the hyacinth.

It seems to be pretty generally conceived that the tuberose will bloom but once. This is certainly erroneous, as I have tested bulbs with special care to ascertain their capacity to bloom continuously for a succession of years, and the spikes were produced regularly. However, a marked diminution in quality was plainly perceptible. For open air culture, the old double-flowering variety, or as it is sometimes known, the Double Italian, is perhaps unsurpassed for general cultivation. The Pearl, introduced a few years since, is not so tall, but with larger flowers, and is better adapted for house culture. The single form is pretty for cut-flower work, reminding one of orange blossoms, both in appearance and fragrance.— Josiah Hoopes in *New York Tribune*.

## THE VICTORIA REGIA.

### HISTORICAL REMINISCENCES.

It was our privilege to see this queen of the water lilies in bloom at Kew Gardens, England, October, 1878. There was a display of water lilies from all parts of the world, in every witchery of form, color and odor—pure white, soft rose-tinted and deep pink, and the loveliest blue. But the most entrancing for form, color, size, and fragrance was the Victoria. She shone, indeed, as the empress of the entire floral dominion.

The present generation cannot realize the interest taken in this superb plant nearly forty years ago—the intense desire to get specimens to Europe, the great efforts, and the provoking failures. Even the seed would refuse to germinate. At last, it was taken over the sea in its native water

and painful care was had as to temperature — even periodical agitations of the fluid, as if to deceive the coy embryo into the idea of the flowing of its natal stream. When success was attained, it was accounted among the florists of the world as “the big thing of the age.” But the conditions of success were so costly: a glass house, a tank of thirty feet diameter, and the water steadily kept up to eighty degrees temperature; private means, unless munificent, could not suffice.

The leaves of the plant are six feet in diameter; they are green above and red underneath, suggestive of the color habit of the foliage of the Begonias, especially *B. sanguinea*, though it should be said that, as a rule, the water lilies have the underside of their leaves of a liver-red, or purplish. These gigantic lily leaves, speaking popularly, are, when full grown, round, and, with the edge turned up two inches or more, look like immense floating tea trays. Large aquatic birds stand on them by the hour, watching for fish to pass by. But those great leaves are ribbed in a most ingenious way, imparting immense strength; so that with a board properly arranged to distribute the pressure, a prodigious weight can be borne. I have some notes which I think were made some thirty years ago, from which we will extract, though the figures seem incredible. It was stated in *Science pour Tous*, that in the aquarium of the botanical garden at Ghent, the head gardener, M. van Houtte, was interested to learn the force required to immerse one of the floating leaves in the water. One leaf supported a child; another was not submerged by the weight of one of the gardeners. He was led to experiment as to the limit of this resistance — loading the surface of one of the largest leaves with bricks. It was found to bear a weight of 760 pounds avoirdupois — that is to say, nearly equal to five men of average weight.

The first successful effort to bring the *Victoria regia* into bloom in England was in the world-famous botanical gardens of the duke of Devonshire, at Chatsworth House. Joseph Paxton, the duke's head gardener, constructed the great glass house for its accommodation, which took the name of its gorgeous occupant. The hint for the construc-

tion of this fairy-like building was derived from a study of the structure of the *Victoria's* leaf.

We may, in passing, say that Mr. Paxton designed the Crystal Palace for the World's Fair in England, 1851, built chiefly of glass and iron, all being primarily due to his study of the leaf mentioned. For this achievement he was knighted, and thus became Sir Joseph Paxton.

The first flower of *Victoria regia* in England, was in November, 1849. The event brought together a distinguished concourse of visitors of the nobility and *literati*. A novel event was the appearance, on the occasion, of little Miss Annie Paxton, who, dressed in costume of a fairy, took her place in one of the tray-like leaves, and, like a Naiad of the waters, presided as the fairy guardian of this beautiful floral queen. Such an event could not be less than inspiring; accordingly the muse of the famous Douglas W. Jerrold produced the following:

"On unbent leaf, in fairy guise  
Reflected in the water,  
Beloved, admired by heart and eyes,  
Stands Annie, Paxton's daughter.

Accept a wish, my little maid,  
Begotten at the minute,  
That scenes so bright may never fade,  
You still the fairy in it.

That all your life, nor care, nor grief  
May load the wingéd hours  
With weight to bend a lily's leaf,  
But all around be flowers."

It will astonish some to be told that the *Victoria regia* was made to flower in a tank in the open air by Mr. E. D. Sturtevant, at Bordentown, N. J., last August, the water being kept at its right temperature by pipes. I was one of a small party invited to witness the event, but was far away at the time. An enthusiastic friend wrote me about it, and what follows is mainly from his letter: At the first visit the leaves were six feet across, with a rim about two inches high, and a bud just visible in the depths. It was expected



to bloom in two weeks, and we intended to go again with yourself, Mrs. Treat, and others. Alas! the bud shot up with almost visible rapidity, and bloomed on Sunday evening. I saw it at its second opening, when it was somewhat the worse. At its first opening, the flower rested on the water, a pure white blossom a foot in diameter, and filled the air with a delicious pine-apple perfume; at its second, it was raised above the surface, the petals had become a pale rose, and were strongly reflexed, while the perfume was entirely gone. The stamens were a deep rose color, and folded down, so as to completely cover the stigma, etc. On this second evening, a strange event took place, which we unfortunately did not see, as we had to go to the train, but which was communicated by those who did see it. About half-past seven P. M. the stamens suddenly lifted themselves, and with quite a perceptible jerk shook a mass of pollen down on the stigma. It seems hardly credible, but it is true; this *Victoria* had produced four great leaves, with another partly unrolled, and had bloomed, all from a plant six inches high, with one small leaf, in just four months. One would think that the forming of its cells ought to be visible with a hand lens.

To give completeness to this little sketch, let me quote from the *American Cyclopædia*: "The flower is of two days' duration. The first day it opens about 6 P. M., and remains open until about the same hour next morning; in this stage it is cup-shaped, twelve to sixteen inches across, with numerous pure white petals, and emits a delightful fragrance. The second evening, the flower opens again, but it presents an entirely different appearance; the petals are now of a rosy-pink color, and reflexed, or bent downward from the center, to form a handsome coronet, but now without odor; the flower closes toward morning, and during the day it sinks beneath the surface to ripen the seed.—Prof. Samuel Lockwood in *The Canadian Horticulturist*.

## THE CLEMATIS.

This is one of the most beautiful and popular of garden flowers. It is a member of the Crowfoot family of plants—to which also belong the columbine, anemone, meadow-rue, larkspur and pæony—and abounds throughout the temperate regions of the northern hemisphere, and occasionally occurs in tropical and subtropical parts, both north and south of the equator. But beyond the New Zealand species, *indivisa*, which is a winter-blooming, profuse, white-flowered, showy kind, and a greenhouse plant with us, the hardy clematises only appeal to our notice.

Everyone knows the common wild Virgin's-Bower (*C. virginiana*) that drapes the branches of the trees, mantles bushes in the thickets, trails over rocks and banks, and is so lavish of its flowery wreaths in summer, and fleecy akenes in the fall. Europe yields us others not unlike it. The Traveler's Joy (*C. vitalba*), rougher, may be not so pretty; and *C. flammula* is a neater and more copious plant, with whiter and sweet-scented flowers. From the higher mountains of Chinese Tartary comes the *C. graveolens*, a fragrant, yellow-flowered species, perfectly hardy in our gardens, a rampant grower, whose akenes in the fall are flossier, whiter and more abundant than those of other common garden kinds. From Texas comes *C. coccinea*, with orange-scarlet flowers, shaped like those of our common leather-flowered clematises, as *pitcheri* and *viorna*.

The above, being vigorous vines, hardy and profusely floriferous, are well fitted for use as screens in front of the veranda, to cover naked stumps or tree trunks, envelop rocks or tree roots, or face lattice or other fences used to screen unsightly objects. Both *coccinea* and *flammula* are worthy of special care.

But the large-flowered clematises so greatly favored in our gardens, are of a different race, and *jackmani* may be

taken as the best as well as the best known among them. Jackman, of England, claims it as one of his first hybrids; that he raised it in '78, and bloomed it for the first time in '62. Now comes the eminent French arboriculturist, A. Lavalée, and declares it to be a Japanese species called *C. habonensis*. No matter, it is a capital garden flower; so are the whole set of its kind, *C. lanuginosa*, *patens*, *florida* and the rest of them. But as some of them blossom in spring, others in summer and others from summer into fall, and as the earlier-blooming ones flower from old wood, and the late seasoned ones from the young wood, we require to know something about them in order to be able to treat them intelligently.

The "*patens*" type represents the spring-bloomers. They bloom from the old wood, and are in beauty when the azaleas and rhododendrons, bleeding-hearts and oriental poppies are in perfection. A vigorous growth should be encouraged in summer, and no pruning be done in fall; but all the wood possible should be retained till spring; then, after the plants are out of bloom, we may prune if need be. Lord Londesborough, mauve; Lady Londesborough, silver gray; Miss Bateman, white; The Queen, lavender; Vesta, white; Stella, violet; Albert Victor, lavender; standishii, mauve-purple; and Sir Garnet Wolseley, bluish, are good varieties of this kind. Countess of Lovelace, bluish-lilac; Duchess of Edinburgh, white; fortunei, white; and John Gould Veitch, lavender-blue, are double-flowering clematises coming in with, or soon after, the preceding single ones, and requiring like treatment, except, perhaps, a more sheltered position, or to be taken down and covered with earth in winter, as we do with raspberry bushes or grape-vines.

The "*lanuginosa*" type represents the large, showy-flowered varieties that come into bloom in midsummer and continue more or less for a month or two. They bloom from short lateral growths from the old wood, hence we should be careful to preserve as much old wood as possible. *Lanuginosa* and its varieties, lavender to white; *henryi*, creamy white; *alba magna*, white; *gem*, lavender; William Ken-

nett, lavender; Morikata Oké, satiny white, and Otto Froebel, grayish white, are good sorts.

The "viticella" and "jackmanni" types include the well known hardy race whose showy, purple flowers are so familiar in our gardens in summer and fall. They blossom successively on the current Summer's shoots; hence are benefited by being shortened back in winter. All things considered, jackmanni is the best among them. But there are others also of exceptional merit; for instance, Lady Bovill, grayish blue; Mrs. James Bateman, lavender; Thomas Moore, puce violet; viticella rubra grandiflora, claret; Alexandra, reddish violet; Prince of Wales, puce purple; Rubella, claret purple; Star of India, reddish plum; tunbridgensis, bluish mauve, and velutina purpurea, dark mulberry.

Clematises love good treatment, rich, well-drained soil, a sunny situation and protection from cutting winds. A mulching over their roots in summer and occasional heavy waterings during dry weather are well repaid in vigorous growth and profusion of blossoms.

The showy clematises, as represented in the patens, lanuginosa and jackmanni sets, are worthy of the choicest places in our gardens, up the pillars of the veranda, on the door posts, around our windows, on pillars or trellises specially prepared for them, or wherever else a pretty vine may be desirable. And the jackmanni set are often used as bedding plants by being planted thickly in beds, and the vines spread thickly over the ground and pegged closely to it. They are propagated by layers of the vines, cuttings, grafting or root-cuttings, division of the clumps, and by seeds; but, most frequently, by layers and division, except in the case of florists, who have come to use cuttings mostly.

But, apart from the clematis as a vine, we know it intimately as a common hardy herbaceous perennial garden plant, in *C. recta*, for instance. This, the upright Virgin's Bower, a native of Europe, grows three to six feet high, and bears large masses of white flowers in June. There are several forms of it; the double is one of the whitest. *Integrifolia* is a small bluish-purple one; *tubiflora*, a handsomer

plant, with small bell-shaped, blue flowers, and davidiana, from Northern China, which has terminal and axillary masses of hyacinth-like blue, sweetly fragrant flowers. It is quite hardy, and one of the finest summer-blooming perennials.—Wm. Falconer in *Rural New Yorker*.

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The complaints of a nurseryman in the *Gardeners' Monthly* for January, of having many unprofitable questions put to him, and which he can ill afford time to answer reminds me that I frequently find myself sailing in the same kind of ship by having numerous questions asked and inquiries made, both verbal and written, about the Clematis. It has occurred to me that it might be advisable, if acceptable to you, to offer a few remarks concerning the Clematis, through the columns of your very excellent *Gardeners' Monthly*. In so doing I trust it may be remembered that the following remarks are not intended for the edification of gardeners or nurserymen, or any of the profession, who, in all probability, know the subject much better than I do.

But inasmuch as the Clematis is becoming very popular and deservedly gaining favor every day; and, as the professionals say or write very little upon the subject in the periodicals of the day, so far as I have seen, I will endeavor to answer the querist as best I can, and he must take the reply for what it is worth. There appears to be a lack of general information upon the subject, and the inquiries are as numerous about the old as the new varieties.

According to the books, the word Clematis is derived from the Greek word *klema*, meaning a vine branch, because most of the species climb like a vine.

The Clematis belongs to a very extensive genus of mostly hard-wooded, climbing, ornamental, flowering, shrubby plants, which, one species or other, is indigenous to almost every quarter of the globe. I once heard a lady exclaim to another, while admiring a beautiful henryi: "Oh! what a

beautiful flower; what a lovely Clematis! Where do Clematises come from?" The reply was: "Oh — oh — they come — they come — they come from all over." How much "all over" was intended to imply I cannot say. But truly, sir, they come from all over. They are almost cosmopolitan. They are here, and they are there, and they are everywhere. Yet many people seem to think there are very few varieties in existence, and these few are considered comparatively new. Whereas there are from 250 to 300 varieties and species in regular cultivation, and of this number, perhaps 250 are what are called large-flowered hybrid garden varieties. Some of the species have been in cultivation over three hundred years, and are still quite popular.

Jackman says: "The scientific records give a total of about 230 species. Of these 17 are European; 43 of Indian origin; 9 are Javanese; Persia, 1; 30 of the finest species from China and Japan; 11 from Siberia; Feejee Islands, 2; South America, 24; Central America and the West Indies, 9; North America, 35; African tropical mainland, 14; South Africa, 4; Mascaren Islands and Madagascar, 6; New Holland, 15; New Zealand, 5." Paxton gives a long list of species from about 30 different countries and parts of countries, the names of which are unnecessary to this article and would take too much space.

Their habitat extending over such a wide extent of country, their natural habit, character and constitution, etc., must necessarily differ very considerably.

Some of the species are hardy, non-climbing, soft-wooded herbaceous perennials, as in *erecta* and its varieties, growing about two feet high, furnished with large corymbs of white, sweet-scented flowers.

Others are soft-wooded and climbing herbaceous perennials, as in *coccinea*, which, I believe, is comparatively new and a native of Texas. I have not had this long enough to know much about it.

Others again are non-climbing, sub-shrubby and hard-wooded, growing erect one or two feet, as in *viticellana*, and others four or five feet, requiring the support of a stake, and being covered with large panicles or umbels of

sweet-scented white or blue flowers as in *cœrulea odorata* and its varieties. Other species are tender, evergreen, winter-flowering and require the protection of a conservatory or a hothouse.

But to attempt to describe many of the species would soon take up too much of your valuable space. The first *Clematis* introduced into England was our old favorite *Clematis viticella*, from Spain in 1569, in the reign of Queen Elizabeth, who, it is said, was delighted to be called the Virgin Queen, and in compliment to her majesty the *Clematis* was very appropriately and very prettily called the Virgin's Bower.

In the same year was brought into cultivation the old wayfarer of the English hedgerows, *Clematis vitalba*, commonly called Traveler's Joy, Virgin's Bower, Welcome Traveler, Old Man's Beard, White Vine, Smoking Cane, Cigar Plant, Pithwine, etc. One might think a plant having all these common names must be of some importance. Then came *Clematis flammula*, a well-known European species and called sweet-scented *Clematis*. After this the pretty little *crispa*, a native of North America and of the *viticella* type, is now becoming quite fashionable again. Next in importance, *Clematis virginiana*, which I think is best of the old common white sorts, but which has no distinctive common name, I believe, and often gets confounded with the *vitalba* under the name of Virgin's Bower. Besides these have been raised hosts of others, of little importance just now, down to about 1835, when was introduced *azurea* or *cœrulea*, now called *azurea grandiflora* or *patens*. Flower about 5 inches in diameter, eight sepals. Sepals somewhat recurved and reflexed, of a delicate azure blue, hence its name. About the same time was introduced *sieboldii*, under the name of *florida bicolor*. Flower about 3 inches across, sepals standing straight out from the disc, flat and broad, and the center filled with a rosette of purple petaloid stamens, forming a very pretty flower. Sepals creamy white. From Japan by Dr. Siebold.

About 1851, was sent to London from China, I think, by Mr. Forsyth, the grand old *lanuginosa*. Flowers, 6 to 8 inches across; eight sepals, pale lavender. About 1863, was

sent from Japan, by Mr. Robert Fortune to Messrs. Standish & Noble, of London, I believe, that fine old double white Clematis named *fortunei*. Its color is creamy white, sweet scented, 4 to 5 inches diameter. About the same time came *standishii*; color, bluish mauve. Also John Gould Veitch, a beautiful double blue or lavender blue; both by Mr. Fortune from Japan. From these last named sorts, viz.: *patens*, *lanuginosa*, *fortunei*, *standishii* and *viticella*, have been derived these magnificent hybrid varieties which we have now in cultivation.

So far as my experience goes, I think the Clematis is a good thing which is destined to become as deservedly universally popular, for out-door garden culture, as the rose; and for indoors, too, for that matter. For the greenhouse, the conservatory, the parlor window, to cover rock-work or rustic arbors, or any lattice work, pillars of the veranda or porch, or any other ornamental use where flowers are desirable.

For individual specimens, trained to ornamental forms or designs on the lawn, or making good pot specimens to place about the lawn, they cannot be equalled by any other plant for this purpose or climate. For permanently bedding out in the flower beds the Clematis is superior to any other individual class or species of bedding-out plant with which I am familiar. The colors are all that can be desired, and withal, it is the cheapest bedding-out flowering plant we have, for so good a thing.

Three or four dollars do not go far, even at the low price of a dollar a dozen, for bedding-out plants, to fill a bed prettily. The same sum would nearly fill the same bed with Clematises the first summer, and certainly the second, with good plants to start with; for one good strong plant of Clematis will cover the space of a dozen of the others. The tender bedding plants usually die and have to be renewed every year; but the Clematis when established, is "there," and better the second than the first year. The older the plant the younger and fresher it appears. The Clematis is well adapted to our soil and climate. It will grow where any other plant will grow and thrive, save and except under water, just in pro-



portion to the treatment it receives. It is not at all fastidious as to soil or treatment, yet no plant is more grateful or will respond more quickly to kind and generous culture. The Clematis likes best a deep, moderately light, but rich sandy loam, well drained. After a plant has become four or five years established it will make a growth of 4 or 5 to 8 or 10 feet in height in a season, according as the plant is of a weaker or stronger habit of growth; and, if carefully trained, will cover as much space in width. Many of the varieties of the jackmanni and viticella types will throw their large umbels of flowers so far above their foliage as to present one complete mass of flowers, with scarcely room for a green leaf to appear. These large umbels or panicles of flowers are made up of six to ten individual flowers, each 4 to 6 inches in diameter, usually four to six sepals of, for the most part in these types, the deepest and richest velvety purple to almost black. These types commence flowering the forepart of July and continue on till the frost kills their foliage in October or November. The different groups give us about all the colors that can be desired, from the purest white to almost black, from azure-blue to yellow, and from green to scarlet. It is true we could wish the yellow and the scarlet could be improved in size. They are single, semi-double, rosettes and double; sweet scented and not scented. I have had them in flower from 2 inches high to 10 feet high; and also in size from 2 inches to 10 inches in diameter. I have had Jeanne d' Arc measure a full 10 inches across and lawsoniana  $9\frac{1}{2}$  inches in diameter of flower. Eight to  $9\frac{1}{2}$  inches are quite common in many varieties, when well grown; and size appears to be now the prevailing fashion. The flowers held in perfection from twelve to twenty days, usually fifteen to eighteen.

I have said they are hardy. They are, and almost as persistent as a root of rhubarb, and should their tops become winter killed, from very extreme weather, they will start up in the spring like a shoot of asparagus. I have compared them to the rose. They are as beautiful in color and as sweet in perfume. But, unlike our beautiful tea roses, which shrink and wither in the scorching hot sun and have to be taken

up and coddled through the winter, the Clematis will glory in the summer's heat and scarcely wince at the winter's cold.

Hardy as they are, however, no plant will be more benefited by, or more grateful for, a little winter protection with a little littery manure or something of that kind. What varieties would I recommend for general planting? That is a rather difficult matter to decide, and must depend on the purpose for which they are wanted and on the fancy of the cultivator. The family is divided into sections or groups, not botanically, however, but for the convenience of gardeners and amateur planters.

*The Montana Group*—are strong growers and will flower in abundance from January to May on the old ripened wood of the previous year's growth; the flowers are only medium in size and in clusters, and excellent for cut flowers; but, of course, in order to do this they require the protection of a cool greenhouse.

*The Patens Group*—give us the earliest large-flowered climbers; flowers singly, from the ripened wood of the previous year's growth; mostly light-colored flowers; May and June out of doors.

*The Florida Group*.—Large flowers from the ripened wood of the previous year's growth; but making a longer growth than the patens before flowering, and consequently flowering later; June and July. As grown now, mostly double flowers and often sweet-scented.

*Graveolens Group*.—Mostly rampant climbers, small flowers, often in large panicles; July to September.

*Lanuginosa Group*.—Large flowers, six to eight sepals; 6 to 9½ inches diameter; climbing; blooming successionally summer and autumn. Flowers on short lateral summer shoots, dispersed and continuous. This group is divided into early and late bloomers; June to October.

*Viticella Group*.—Mostly large-flowered climbers; blooming in continuous masses on long summer shoots; July to October.

*The Jackmanni Group*—are large-flowered climbers; blooming successionally in summer and autumn, in contin-

uous masses. This group make a long and strong summer growth before flowering, hence a little later in coming into bloom. They are divided into early and late bloomers. They begin flowering about the first of July and continue until the frosts kill their foliage and flowers in October or November. A slight frost does not hurt them. They will bear about as much frost as a grapevine.

*Cærulea odorata Group*.—Non-climbing; sub-shrubby; flowering on summer shoots; July to September.

*Erecta Group*.—Non-climbing; herbaceous; flowering June to September.

These two latter groups are not very fashionable in this country, so far as I have seen, though a few have been grown for many years.

I will endeavor to name a few kinds from two or three of the principal groups; but, of course, a full description can not be given for want of space.

*Patens Group*.—Albert Victor, deep lavender; Fair Rosamond, bluish-white; Lord Gifford, rosy lilac; Lady Londesborough, silver-gray; Miss Bateman, pure white; Mrs. Quilter, white.

*Florida Group*.—Aurora, semi-double, pinkish-lilac; Countess of Lovelace, double, bluish-lilac; Duchess of Edinburgh, double, pure white; John Gould Veitch, double, lavender blue; Lucy Lemoine, double, white; Venus Victrix, double, pale-mauve.

*Lanuginosa Group*.—Alba magna, finest white; Angelina, pale, bluish-mauve; Blue Gem, pale cœrulean-blue; William Kennett, bluish-lavender; Duchess of Teck, white; Fairy Queen, pale flesh color; Henryi, beautiful creamy white; Lawsoniana, rosy-purple.

*Viticella Group*.—Lady Bovill, soft grayish-blue; Madam Grange, maroon crimson; Mrs. James Bateman, reddish-lilac; Viticella rubra grandiflora, claret crimson; Viticella venosa, reddish-purple.

*Jackmanni Group*.—Prince of Wales, deep puce-purple; Alexandra, reddish-violet; Gipsy Queen, dark velvety purple; Guiding Star, claret-crimson; Jackmanni, intense violet-

purple; Rubella, deep velvety claret-purple.— Josiah Saltern in *Gardeners' Monthly*.

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### PROPAGATING THE CLEMATIS.

The best way to propagate the varieties of hybrid clematis, and obtain strong plants, is by layers. The plants are set in rich soil, and as the stems grow they are pegged down and covered at the joints with soil. They soon root, and give strong plants in two years. They must not be cut off from the main plant till the second year. Some varieties as *C. jackmanni*, grow with comparative ease from cuttings made in summer from new growth. In one instance, a cutting made in July, and planted out the following spring, gave one hundred and seventy blossoms.—G. C. Woolson, in *Country Gentleman*.

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### TREES AND CLIMBERS.

Mr. Andrew Sherwood is confident that combinations of trees and ornamental vines will constitute in course of time one of the glories of American gardening. He cites in the *Rural New Yorker*, some illustrative examples—first of an old peach covered with roses, worth going a long way to see.

“A climbing rose (the well-known *Prairie Queen*), had been planted at the root of the tree some ten years ago, receiving no more attention except an occasional bucket of soapsuds and an annual application of soot. But under the sheltering arms of the old peach it has flourished amazingly, until its branches are no less than twenty or thirty feet in length. It was a mass of inflorescence when I saw it, containing not less than a thousand full-blown roses and far surpassing any similar display I have ever seen. The lady of the house informed me that for several years it had not failed to present the same gorgeous appearance with each recurring June.”

But why not introduce the element of winter shelter and brightness by using evergreens as support and background

not only for roses, but for other climbers notable for blossoms, foliage or berries? In reference to this point the observing writer calls up other recollections:

"One of the finest sights I have ever seen was a hemlock tree by the roadside in New England, covered all over with a most luxuriant vine of the common bitter-sweet, whose scarlet-and-orange berries contrasted finely with the green of the hemlock. Neither have I forgotten another evergreen—a balsam fir—by a roadside in the Empire state, which was beautifully festooned with the common Virginia creeper. In this case the autumn tints, crimson and fiery red, blended with the green, or rather the steely-blue of the balsam, presented a scene not only rich but indescribably beautiful."

We quote one other instance of nature's own work in this admirable way:

"I know, too, an elm by a river in the Keystone state, whose hirsute arms are hung with this drapery of Virginia creeper in a most remarkable manner. Every branch, both great and small, is wreathed and twined in a way which the hand of man can at best only imitate but never equal. In the early days of October, when the leaves have changed to crimson and scarlet, I must say I have never seen another elm to compare with it."

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### ORNAMENTAL PLANTING.

Begin by placing the dwelling house eight or ten rods from the highway, with the barn still further back, and a little to one side, rather than across the road in front of the parlor windows. The vegetable and fruit gardens should be in the rear of the house and near the kitchen and barn. If you can not afford to devote much time or money at first to ornamental planting, be careful to start right and make no mistakes. Every stroke should count, and without experience and good advice your labor will be half wasted. About one-tenth of the cost of buildings should be set down for improving the grounds. It would be better to employ a person of skill to aid you, but if this is impossible, read the

works of Downing and Frank Scott, and begin to study trees at all seasons of the year.

#### HAVE A PLACE,

once for all, in your head at least, or, better, on paper, and work to it persistently. Do little grading. Downing says: "We see all ignorant persons who set about embellishing pleasure grounds, commence leveling the surface. This is a fearful fallacy to eye and purse." Better emphasize inequalities by planting tall trees on the higher portions of large grounds, leaving the hollows unplanted. Provide for no more paths or drives than are needed for daily use. Guard against attempting too much in any direction. Too many trees, too much shrubbery, too many flower-beds, walks and roads — this is the common error.

#### A GOOD LAWN

is the essential element about which the other graces cluster. For this rich soil, moisture and fine grass are needed. Do not divide or clutter up the lawn with too many trees, shrubs or flowers. Be sure to leave in planting several open spaces through the entire extent, so that from the porch or windows, as well as from points without, there will be an unobstructed view over the turf. This will give an appearance of spaciousness which cannot otherwise be attained. Plant, according to the size of the ground, small trees and shrubs in small places. One Norway spruce or large cherry tree is often the ruin of a small yard. As a general rule, plant the large trees on the outside lines, with the smaller trees or shrubs nearer the house, or the lawn's center. Plant no large trees within from forty to sixty feet of the house. Such trees shut out the pleasant sunlight, scatter leaves on the roof, rot the shingles, spoil the water in the cistern, kill the grass, keep the walls and paths damp and shut out pleasing prospects. They may not be out of place when small but after they have grown the owner has become attached to them and hesitates to take them out.

#### TREES IN THEIR PROPER PLACES

shelter the dwelling and barns from piercing winds; they

add comfort and joy to man and beast; they economize the food of animals and save fuel in the sitting room; they harbor birds; they afford shade in summer; they are the glory of home grounds, and will serve for generations to remind those who enjoy them of the thoughtful and generous hand which planted them. They should not be set in straight rows or at equal distances. Even as a shelter belt on the exposed side of a house they are better arranged in groups which "break joints." Near the projecting points of this irregular line of foliage is a good place for single trees, like islands near a cape, leaving open bays of turf to flow between them into the deeper and more sheltered recesses. Avoid formality. Even in roadside planting, a row of trees will be marred sooner or later by vacancies or unequal growth. Finer effects are produced by planting irregular, mixed groups at salient points. Plant so as to conceal from the best points of house and grounds unsightly objects near or remote. Plant trees or shrub groups on the concave side of sharp turns in walks or drives, and in the angles where paths or roads diverge.

#### EVERGREENS

are more monotonous than deciduous trees, yet they are green when other trees look dead. Their cones and young spring growth add some variety. In winter they are darker, the bright color returning with the warmth of the early year. In autumn they shed the leaves which grew one or two or more years before. They are particularly charming when snow, which loads their limbs, is seen in contrast with their dark green leaves. A deciduous tree belongs to a higher type, and presents a greater variety of aspect—without leaves, with young leaves, with full grown leaves and with brilliantly colored leaves of autumn. The bark is smooth or rough, the twigs are few or many, the spray scatters into infinite diversity of form and color; the leaves vary in size, shape, color, direction—while in general form no two are alike, and the masses of foliage break into light and shadow in a distinctive way for each species, and almost for every individual. Some evergreens should be used, and more where there are few or none in the surrounding forests.

Too many will make a place gloomy and sombre—too few will leave it with a cold and naked look in winter.

#### SELECTION AND CARE.

Choose nursery-grown trees, especially evergreens, which have been transplanted. They will have more roots and are more certain to make a vigorous growth. Do not select large trees, even at low prices. Avoid high-priced novelties until you have experience. Do not try too many kinds, nor more than can attain good development on your place. It is allowable to plant thickly at first for immediate effect, but if so, arrange for thinning out at the beginning, and remove remorselessly before the trees crowd each other. Select trees easily grown and of such species as have been proved thrifty in the region where you live. Do not choose short-lived trees, nor trees subject to the borer, like the mountain ash, nor liable to die in the lower limbs, like the balsam fir. After planting, give the best of care by cultivation, fertilizing and mulching. Do not cut them into grotesque or formal shapes. Look years ahead, and prune with reference to the future. Thinning had better be done a little each year and not a large amount once in five or ten years. Thin before the beauty of your best trees is lost by crowding. Remember that the lower limbs, especially of evergreens, will not start out aright when once removed.

#### SHRUBS, VINES AND FLOWERS.

These will be used for the final touches of embellishment. Shrubs are valued for their bloom as well as for form and foliage. Each variety will serve some special end. As a rule, plant in irregular groups as directed for trees. At projecting points in shrub masses plant some hardy herbaceous perennials. Use vines for porches or for covering a half dead tree or stump, or rubbish pile. Plant flowers mostly at the side of the house, in irregular but gracefully-shaped beds, and while trees are young, about their trunks, perhaps. No special paths are needed about flower or shrub groups. Rock work is seldom satisfactory, and is only appropriate



in a retired portion of your grounds. A pile of shells, rocks and scoria in the front yard is badly out of place. Heap them in some back and shady corner, and you will find great delight in transplanting from woods and meadows an assortment of hepaticas, spring beauties, blood-roots, trilliums, bell worts, phloxes and ferns. If you have a pond near by, introduce some water lilies, cat-tail flags, pickerel weed, arrowhead, and near by set some Wisconsin weeping willows and birches and ashes. Do not despise flower, shrub or tree because it is native and "common." As a rule, the best known is better than the imported rarity. Give thought and attention to all the details of the work of making a pleasant home. It is a worthy work. You will be surprised to find how much beauty can be obtained at little cost, and how rapidly everything hastens forward toward the completed plan in your own mind. You will have a constant comfort and a fresh hope realized every year as the trees grow, and transformation follows transformation towards the full development of your original design.—Prof. Beal, in *Trans. Miss. Vall. Hort. Soc.*

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### STRAWBERRIES.

Experience in strawberry growing is worth a good deal, and sometimes costs all of that. I have never found any kind of soil but with good common-sense cultivation would produce a good crop of strawberries. What I call a good crop is 100 bushels to the acre. We often grow twice and sometimes, when everything is favorable, four times that, and I know of three private gardens where each owner picked from 5 bushels to 6½ bushels from a square rod of ground in one season. I know of one man who from 5 plants of Crescent grew in one year a bed that the next year produced 4 bushels of nice fruit. I have raised at the rate of 270 bushels per acre of choice strawberries on ordinary prairie soil that had been worked twenty-five years without manure. Now, what is wanted is, first, a plat of ground as free from weeds as possible, rich enough to produce a good

crop of corn, and rolling enough so the water will not stand upon it.

If you want to grow ten bushels, or more, have the plat long enough to cultivate with a horse; plow and pulverize thoroughly, as early in spring as the ground will work well. No matter whether it is sand or clay, if it will produce good corn, although for clay soil I should recommend somewhat different varieties than for sand. If you are raising many chickens, it may be necessary to enclose the bed with a lath fence, or choose a spot remote from the house or barn. Before you get your ground ready be sure where you are to get your plants; order of some reliable dealer; you can get plants at \$1 for 100 of the best tried varieties.

Now don't take plants from an old bed, whether from your own or as a gift from a neighbor, unless you know they are unmixed; pistillate varieties far outrun all others, and it is not safe to plant from a mixed bed. Have your plants arrive just as your ground is ready, and set them immediately. I have received choice high-priced plants at evening, and have planted them by lantern light rather than keep them over night. Set the plants in rows 3 or 4 feet by 1, if for horse cultivation; if for hand cultivation, 2 by 2 feet. Place so the crown of the plant will be just at the surface of the ground, not above and not below. Hoe them every week as long as weeds grow; if you can afford to cut the runners you will get larger fruit, and about the same quantity as in matted rows. If you let them bear, the year of planting, it will detract from the size of the plants and bed for the next year; it is best to cut off all blossoms as they appear.

In autumn when the ground freezes up to stay, or so it will bear a loaded team, cover the bed all over, just so you can not see the foliage, with dry leaves, marsh hay, the refuse from the sorghum mill, cut stalks, or anything that has no foul seed in it. In the spring leave this all on; if the plants can not push through, open a little. Some remove the mulch and cultivate and replace, but after thirty years' experience, I find the less the mulch and ground are disturbed until after the crop is harvested, the better the fruit

and the more of it. Now about kinds. Because Crescent is the most productive of all, don't plant all Crescent, for it is pistillate, and an acre of them would be useless. The great cause of so many failures is all pistillate plants, and these usually abound in an old bed. Set two rows of one kind and two of another, being sure that every other two rows are perfect in the blossom, then you will have no failure. Crescent is the most productive, Longfellow the most profitable large berry, Countess wonderfully productive, and I have the record of one person who picked of this kind 239 quarts in one day; Wilson is one of the best for shipping and canning, Capt. Jack, Miner's Great Prolific, Vick and Piper are all good and can all be had at \$1 per 100, and only Crescent in this list is pistillate. After the first crop let the bed remain as long as it pays, but set a new bed every year, let it be ever so small — Geo. J. Kellogg, in *Prairie Farmer*.

#### STRAWBERRIES OF THE NORTH.

I am of the opinion that the strawberry will grow nearer the north pole than most of our cultivated fruits. It will succeed far north of the corn-growing belt. I have seen it succeed where the frosts that enter the wall during the winter often remained all summer. It will be interesting to know how far north the strawberry will succeed. Its being capable of being protected gives it an advantage over other fruit. It is quite a consolation for those living far north to know that while they may be deprived of many valuable fruits, they may indulge in the delicious strawberry grown in their own gardens.

One serious drawback to strawberry culture in the north is the effect of late spring frosts, but I doubt whether strawberries at the north are more seriously, or oftener injured by late frosts than at the south. As the strawberry blossoms so early, it is always more or less in danger from this source. When we stop to think of it, the strawberry is really a phenomenon. Its ripening in such a brief space of time is nothing less than marvelous. What other fruit or vegetable have we when the strawberry ripens? At its approach the

growing season has just commenced, and the harvest of most products is far in the distance.

I have a low muck lot on which we have planted strawberries successively for many years. This lot has never escaped the frost entirely until this year, and still we have always gathered a fair crop of berries there. I am not discouraged in growing them on this piece of ground, as the plants increase there rapidly, and plants are my object more than fruit.

For a distance of six or eight miles from the great lakes frosts are hardly ever known to do any damage in the spring, the influence of the lakes being such as to prevent heavy freezing. This kind of protection by bodies of water should be considered by every person locating a fruit farm. Such protection is desirable not only for strawberries, but equally so for grapes, pears and apples.

The strawberry at the north has fewer insect enemies than the strawberry of the south, the white grub being the most troublesome and that only appearing at long intervals. For seven years we escaped the white grub, almost entirely, but last year it appeared in strong force and did us much injury. There is no remedy for it that I am familiar with. We have attempted to dig it out and destroy it, but have doubts about its being a paying enterprise.

Hiil culture of strawberries is not as desirable at the north as at the south, for the reason that they are more liable to be heaved by frost in the winter. On some soils it is easy to protect them by mulching, but on others it is very difficult; but in matted rows the foliage protects them better than mulching. In fact strawberry growers at the north do not design to cover the plant with mulch, but simply cover the space between the rows. We prepare the soil for strawberries the season in advance of planting, by plowing under a good dressing of yard manure and thoroughly subduing the weeds by cultivation with a good cultivator. When winter approaches, we ridge the land to let off the surplus water in early spring and give free action to the frost. An excellent fertilizer for the strawberry is the hoe and horse cultivator. Indeed so beneficial are the results

of these implements on ordinary corn or wheat soil, that strawberries may be grown successfully without the aid of any other fertilizer. Bone dust and ashes are considered the special fertilizers for the strawberry. The good resulting from yard manure applied in the coarsest condition, is largely owing to the mechanical condition which it gives to the soil by decaying after it is plowed under. If the soil is very tenacious we sometimes plow under a crop of fodder corn sown broadcast, after the same is two or three feet high; or a crop of buckwheat, or anything of that nature. Irrigation at the north is not so essential for the strawberry as some have supposed, although it would be exceedingly desirable in all cases. It is, however, an expensive operation, and should be undertaken with great caution. The strawberry lacks quality after irrigation, and is liable to be soft. Few are aware of the quantity of water required to irrigate an acre of land artificially. It requires experience to irrigate, and a novice will find that he has much to learn before he can succeed in irrigation.—Chas. A. Green, in *Rural New Yorker*.

#### SEEDLINGS.

Strawberries and raspberries are easily raised from seed by any one so inclined, and the young people may like the experiment. Crush ripe berries and mix the seed with sand. Sow this mixture about a quarter of an inch deep, cover with light soil and tread on the drill. Keep moist constantly and by fall some plants will have appeared, which, being planted out properly, will show a little fruit the first season, and give a crop the year after. It would be a grand thing to raise a new seedling that would excel any we have, and one day it will be done.—*Green's Fruit Grower*.

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On the Earle fruit farm in southern Illinois, where are forty-five acres of strawberries, Crescent is voted as the most profitable for market. Mr. M. B. Wilson, of the same region, who lately picked from eighty acres prefers "Crescent fertilized with Wilson." This is his present opinion after twenty years of careful experimenting.—*Tribune*.

## RASPBERRY CULTURE.

## WHAT I KNOW ABOUT RASPBERRY GROWING.

Raspberries are attracting more attention at this particular time than ever before. Raspberries have always been appreciated more or less on account of filling in the place nicely between strawberries and blackberries. It is a fruit much admired by many, though never so popular as the strawberry. Up to within a few years there were but few varieties. The Red Antwerp, American, or common Black Cap, and Brinkle's Orange, were popular as far back as I can recollect. As much improvement has been made in late years in the raspberry as in any other fruit; we are now not confined to three or four varieties, but varieties of distinguished merit can be counted by the dozens. I have grown the raspberry for market now twenty-six years, but never to the same extent as at present. I now plant largely of them because I find their culture profitable. Any of you can do as well if you have suitable soil and varieties, and understand the proper mode of culture.

## THE CONDITION OF SUCCESS.

To grow raspberries successfully you must select good soil, well underdrained; let it be clay loam or sandy soil, but prefer upland clay loam. I have known them to do admirably in almost any soil, provided it is rich and not wet. Plow as you would for any other crop; the deeper the better if your soil admits of it. Harrow well; plow out furrows six or seven feet apart and plant in said rows three feet apart—a partial shade I find to advantage. My patches that do best are in an old orchard.

## BLACK RASPBERRIES

are usually planted shallow, an inch or two deep. If it is your intention to tie up your canes, that is deep enough, but if you wish them self-supporting you must plant them so that by after-culture they will be at least three to four inches

deep, otherwise they will not be self-supporting. By so planting, and pinching back, as hereafter described, I never have trouble about my canes blowing or falling down by the weight of fruit.

The first year's growth I pinch back when eight to ten inches long. The second year, and every year thereafter, I pinch back the tips of the growing shoots when from twenty inches to two feet high. They then cease to grow in height, but throw out laterals in all directions, balancing and supporting the main stem effectually. The following spring, early in the season, I cut back all laterals with hand-pruning shears, leaving them from one foot to two feet long, according to the number and strength of canes in the hill. This operation is quickly done and inexpensive. After pruning, I gather and carry out and burn all the *débris* between the rows. I then cultivate, first with a double shovel or bar-shear plow, then in time with a cultivator, as often as it is necessary to keep them clean, free from grass and weeds, up to August, after which I let them rest. It is not a good plan to cultivate too late in the season; you thereby cause them to grow too late to mature the wood sufficiently to withstand the cold of winter. I plow and cultivate them three to four inches deep. You need have no fear of injuring the roots by so cultivating.

#### RED RASPBERRIES.

I plant the same distance as black, three by six feet. This takes 2,420 plants to the acre. I do not cut back the canes of red varieties (as I do the black) until the following spring, except strong growing varieties like the Turner, Conover, Colossal and others of like character. These I cut back during the season of growth, when about three feet high, otherwise they may grow to seven or eight feet, as I have seen them grow, necessitating the cutting away of too much wood in the spring. Treat suckers between the rows as you would weeds, unless you want plants; cut them out when young and tender. Sprouts, or suckers, are a great annoyance in growing red raspberries. If taken in time they need scarce any care. Red raspberries, to do their best, must be

kept in hills the same as black. This can be done by cutting away with a sharp hoe all sprouts, when young, between the hills in the rows, allowing from four to eight canes to the hill. Many growers allow them to grow all along the rows, though not too thick.

#### OLD CANES.

There is a difference of opinion among raspberry growers as to the best time to cut away the old or bearing canes. I have tried both methods, namely, letting the old canes remain all winter and cutting them in spring, or cutting them as soon as I can find time after fruiting, carrying out and burning them. I am satisfied, by adopting the latter method, I destroy many noxious insects, worms in various stages of life that would live over winter, were I to practice the other system. It is argued that the leaf of the old cane has much to do in the growth of the canes that are to bear fruit the following season. I take no stock in that opinion. If your plants are in good condition there will be leaf enough on the young canes to mature them without the assistance of the leaf of the old canes that have already performed their functions by maturing the crop of berries just gathered. Then, again, the old canes are certainly not ornamental. Having an eye for the beautiful as well as the useful, I get rid of them as soon as I can after the fruit has been gathered.

#### TYING UP CANES.

For a long time I advocated and practiced the tying up of canes, first to stakes, then to an iron wire stretched along the rows, fastened to posts every twenty-five to thirty feet. Either of the systems I found expensive and slow work. It did well enough when I had but an acre or two, and did not know any better. But when I had many acres I found it was not the thing to do, especially so when I learned that stakes and wire were of no use, I might say entirely unnecessary. I can not help but sympathize with those who are so far behind the times as to follow that system now. By adopting the pinching back process, at the proper time, I



save the expense of stakes, or posts and wire, and the time necessary to tie the canes to them, and raise as many bushels of as nice berries per acre as I did when I followed the old system.

#### GATHERING BERRIES.

I have often been asked how I manage the many hands necessary to pick my berries, so as to have the job well done, and to have them continue to the end. First, I live near a large city, Dayton Ohio, (too near to save a large part of my apples and pears), and can get all the pickers I need, and my system is as follows: I use a stand with handle holding four quart-baskets to pick into. Each picker is given a stand and a basket-holder, which holds one quart basket. This holder is tied around the waist, enabling the women, girls and boys to use both hands in picking. Thus equipped, they are put two to a row, one on each side. I have a trusty man to be with them continually; his business is, first to see that they pick none but ripe fruit; second, that they pick all that is ripe; third, that they do not damage the berries nor canes; fourth, that they do not skip rows or parts of rows; fifth, that there is no wrestling in the patch. When the stand has four full quarts, they are brought out to where the packing is done, in the shade of one or more trees. Then give them a check for the full stand, and an empty stand filled with baskets to fill again, and so on till the day is over. I have large printed checks good for ten, twenty and thirty checks, which I give in exchange for smaller checks when desired. I pay no one money on account, or in full, until the last picking is over, except in case of sickness or, for other good cause. By adopting this method my hands continue their work until the last picking is over. When pay day comes all are made aware of it, all come, and when we are through with the last picking, all hands collect in the shade and are paid off in full, after which I give them a treat of cider, lemonade and cakes; all have a good time and go away more happy than many worth their millions.

## PACKING AND MARKETING.

There is a very strong disposition about Cincinnati, and where I live, to stick to the old half-bushel drawer (four drawers to the stand), for such berries as will stand shipping well; of course I comply with the wishes of those who buy my berries, *whilst I may not agree with them*. I therefore empty the berries from the quart baskets into which they were picked into the drawers, sixteen quarts to the drawer, put the drawers up in stands, and deliver them at the business places of the parties who buy the crop. Red raspberries are put up in pint baskets, and so shipped. Such varieties as Thwack, Brandywine and Cuthbert can be put in quart baskets, and will so carry to market in good condition. It has been my good luck since I have been in the business to sell all my berries to responsible shippers at home—Dayton. They do the shipping, run all risks, furnish the stands and charge me ten per cent. on sales. I do not retail, get satisfactory prices, and run no risks. One or two parties usually handle all my berries.

## VARIETIES TO PLANT.

Of varieties I will say but little, except to advise those who desire to go into the business to make money, to confine themselves to but few varieties; two or three each of black and red, early and late, are all that are necessary.—N. Ohmer, in *Trans. Miss. Vall. Hort. Soc.*

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Mr. N. Ohmer, of Ohio, has eighteen acres in raspberries, nearly all of the Gregg variety. Part of the plantation is shared by pear trees, the two fruits growing together without seeming detriment to either.—*Tribune*.

A model hill of raspberries, after being trimmed in spring, should have but three or four canes about three and a half feet high and nearly one inch in diameter at the base, each cane having a few side spurs about ten inches long.—*Farmer*.

Mr. Robert Johnston, while thinking that six or seven feet apart is wide enough for the other raspberry and black-

berry rows, finds great advantage in leaving eight feet for every fifth space, to admit a wagon, from which manure may be thrown both ways to reach all the plants.—*Tribune*.

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### NOTES ON GRAPES.

[The following notes on old and new varieties, contributed by William C. Barry to the *Country Gentleman* for January 15-22, 1885, contain answers to so many questions propounded by people desirous of knowing something about the varieties they are advised to set, that they are well deserving of space in this volume. Those recommended in the Society's fruit-list are marked with a star.]

The introduction of many new varieties of grapes, of reputed excellence, during the last few years, has given a fresh impetus to grape culture, and planters, generally, are watching with considerable interest the reports concerning them which are now beginning to be made in different sections of the country.

Soil, climate and locality exert so great an influence upon the grape, that actual experiment alone can determine how a new sort will succeed outside of the place where it originated; hence, we have to depend mainly upon the reports of cultivators in different localities.

The writer proposes to give briefly, the result of his observations the past season and hopes that others will furnish similar information.

Sufficient time has now elapsed to give many of the newer grapes mentioned a fair trial, and in most cases we can regard the conclusions arrived at as nearly correct, although not by any means final.

The season here (Rochester, N. Y.), as a whole, was quite favorable for the grape, although the early part of the summer was cool and wet, and generally unfavorable; but in August and September a succession of warm days and nights brought the fruit rapidly toward maturity. It is believed, therefore, that all the varieties ripened which would do so in an average season. The vineyard where the

observations were made, is favorably situated on one of the hills near the city of Rochester. It has a southern aspect and is protected on the north and west with belts of evergreens. The soil is a deep, gravelly loam, varying to a sandy loam with a gravelly subsoil. The vines of the newer sorts are all quite young as yet and will no doubt give better results when they become older. In some cases our observations were made and conclusions reached from a single plant, which cannot always be regarded as a fair or safe criterion.

The season here is not considered a long one, for the Catawba rarely ripens perfectly. The country around is noted for its freedom from great extremes of cold or heat, as well as from late spring or early autumn frosts, the waters of Lake Ontario, which is only seven miles distant, tempering the atmosphere. I mention these circumstances so that due allowance may be made for the opinions advanced.

It is to be hoped that several kinds from which much was expected and which disappoint us now, may, on longer trial, prove deserving. From the remarks made, it will be noticed that several sorts which otherwise have admirable qualities are apparently of little value here because they fail to ripen. Further south these varieties will no doubt ripen and be of much esteem.

We will now consider the different kinds in their order of ripening, devoting our time mainly to recently introduced sorts.

*\*Moore's Early*—This variety is a pure native. It ripened September 8th, about the same time as Massasoit, three days after the Hartford, fourteen days after the Champion, two or three days before Lady and Brighton, and about two weeks before the Concord. The bunch is of medium size, moderately compact; berry large to very large, round; color black, with a blue bloom; flesh pulpy and of medium quality, better than Champion, but hardly equal to Concord; vine vigorous and hardy, but so far as we can see, only moderately productive. It is a handsome grape, and will sell well in market, although we think the Champion or Hartford to be more profitable.

*Rochester* — Ellwanger and Barry's seedling is also a native, and ripened September 10th. The bunch is large, generally double shouldered, very compact; berry of medium size, dark purple; flesh melting, vinous, sweet, highly perfumed and rich. The vine is vigorous, hardy, with remarkably healthy foliage and bears heavy crops in the worst of seasons, the fruit setting well under the most adverse circumstances. The fruit must be gathered and used as soon as ripe, for if allowed to become too ripe, it drops. Although this grape was introduced several years ago, it is rarely found owing to the difficulty experienced in propagating it. It is referred to here on account of its excellence, either for the garden or vineyard, and we think it deserves to be disseminated, even if its propagation be slow and expensive. One cultivator in Canada goes so far as to say that the originators have not bestowed on it the praise to which it is justly entitled. On further trial over a wider extent of territory it may develop faults which have not been noticed here.

\* *Lady* — A white seedling of the Concord. Bunch of medium size, moderately compact; flesh tender and pleasant, but not rich; vine vigorous, hardy and productive. It ripened September 10th, and is a valuable, early, white grape.

*Eumelan* — Introduced several years ago by Dr. Grant, is almost too old a variety to be mentioned among these grapes, but its fine quality entitles it to consideration as an amateur's grape. Propagators cannot increase it profitably, hence it does not find its way into as many gardens as it should. Bunch of medium size, but variable, sometimes large, often small, somewhat loose; berry of medium size, black, with a thick, blue bloom; flesh juicy, rich and of superior quality; vine moderately vigorous, hardy and yields well. It succeeds best when grafted on a strong grower, and is valuable only for the amateur who desires a fruit of the best quality. It ripened September 11th.

\* *Brighton* — A cross of the Concord and Diana Hamburg, is another rather old sort which has done so well this year that it would seem unfair to overlook it. In point of quality

it is not excelled by any grape grown in the open air, but it must be gathered and eaten as soon as it is ripe, for, when permitted to remain on the vines too long, it loses its flavor. The berry and bunch are large and handsome, and the vine is vigorous and productive. In some situations the foliage mildews, sometimes only slightly, and again seriously; but it generally succeeds in favorable localities under careful culture. Recently it has been planted quite extensively for market, but care should be observed in selecting a suitable location. An amateur's collection which does not include the Brighton would certainly be incomplete. It ripened September 11th, ten days before the Concord and about a week after the Hartford.

*Early Victor* — Raised by John Burr, is one of the newest grapes and, therefore, not very widely distributed as yet. The bunch is rather small or of medium size and compact. The berry is of medium size, round, black, covered with bloom; flesh slightly pulpy, very sweet and pleasant, but without any vinous spirit, which, to some tastes, is agreeable. It ripened September 13th, five days after Moore's Early, eight days after the Hartford and eighteen days after the Champion, and only ten before the Concord. It was supposed to be earlier than Moore's Early, but it does not prove to be so this season, and it looks as if this sort would not occupy the place destined for it, although it is a good grape in its way.

*Amber Queen* is a variety in which I have been considerably interested on account of its superior quality, but I doubt whether it is destined to become popular, owing to a serious defect which it has of not setting its fruit well. The bunch and berry are of medium size; color a bronzed purple overspread with bloom; flesh tender, sprightly, vinous and very rich; vine vigorous and productive, with a healthy foliage, but its leaves have a yellowish tint by which plants of this variety may be quickly and surely identified. It ripened September 13th.

*Lindley* — One of Rogers' red varieties, has done so well in several localities, as to be esteemed one of the best red grapes in cultivation. Like all hybrid grapes, it develops

faults occasionally, which are often of slight importance, but frequently serious under certain unfavorable circumstances. So far as I know, the greatest defect is that of failing to set a full crop regularly. One of its striking characteristics is its beautiful color, a bright, clear shade of red which attracts the eye to it at once, even when it is surrounded by larger and more showy grapes. Nor is one liable to be disappointed after tasting it. Its good quality renders it a favorite immediately, and the pleasure it gives the palate is not easily forgotten. We regard it as one of the best red grapes in our vineyard, and from what we know of it, we should rank it among the standard sorts for the garden or vineyard. Strange to say, for some cause or another, this variety of the Rogers has not been disseminated to the same extent as some others less worthy. It ripened September 15th, a week before the Concord.

*\*Duchess*—One of the new white grapes, is said to have been produced by crossing a white Concord seedling with Delaware or Walter. The bunch is medium to large, long, shouldered, very compact, somewhat crowded; berries of medium size, but not uniform, some being quite small; form roundish; skin thick, generally dotted with small black spots about the size of a pin's head; color light green at first, becoming greenish yellow when ripe; fruit almost transparent; flesh tender, without pulp, juicy, sweet, crisp, rich, and in quality it holds the highest place; vine vigorous and productive, and the foliage that I have seen is healthy, though in some places it is said to mildew badly. Grown with care, the Duchess will, no doubt, prove to be a valuable white grape for the amateur, and, perhaps in favorable localities may be cultivated successfully on a larger scale for market. It ripened September 18th, with Rebecca, five days before the Concord.

*\*Worden*—Is an old variety, the value of which does not seem to have been appreciated until quite recently: hence it is not widely known as yet. For a long time it seems to have been regarded as identical with the Concord, possessing no points of superiority over that sort. This misapprehension, perhaps, arose from the fact that a spurious kind,

or perchance the Concord itself, had been distributed under the name of Worden. Careful observers, who had the genuine plants, discovered a marked difference between it and the Concord, and claimed for it superiority in several respects over that variety; a decision in which planters generally now acquiesce. It resembles the Concord closely, having all the characteristics of that well known sort, but the berry is larger, a little better in quality, and it ripens a few days earlier. To the casual observer, the points of difference may not seem sufficiently striking, but if a vine of the Worden, loaded with fruit, be compared with the Concord, a marked distinction will be noticed. We have watched the two sorts closely for two or three years, and compared them carefully, and have arrived at the conclusion that the Concord has a most formidable rival, which is destined at no distant day to supplant that old and famous sort. A grape which bids fair to accomplish this result must, indeed, be a remarkable and valuable one, and its acquisition marks an interesting and important era in grape culture in the United States. It ripened September 20th, three days in advance of the Concord.

[With us, it has usually ripened, for several years, about a week or ten days before the Concord.—*Eds. C. G.*]

*Vergennes* — A chance seedling from Vermont, and introduced only a few years since, has attracted considerable attention on account of its size and keeping qualities. The bunch is of medium size and somewhat loose, not uniform; berries large, round; skin very thick, tough, red, overspread with a thick bloom; flesh quite pulpy, pleasant, but not rich. It is a handsome grape, but its dull color greatly detracts from its beauty. Its chief value lies in its keeping quality. The vine is vigorous, hardy, healthy and productive. It seems to be a variety which will do well with ordinary care, and therefore may be considered promising for market. It ripens at the same time as the Concord, and not with the Hartford, as was expected.

*Gaertner* — Rogers' No. 14, is another of the Rogers hybrids which is not so well known as it deserves to be. The bunch is large; berry very large, round; skin thick, and of



a beautiful light red color, with purple bloom; fruit transparent; flesh slightly pulpy, sweet, pleasant, rich. The vine is vigorous, healthy and productive. It is unquestionably the handsomest grape known for open air culture, and merits special attention from fruit growers. It ripened September 23d, or with the Concord.

*Niagara*—It is believed that in this variety the white grape so long sought after, and the need of which has been so much felt, has in a large degree been supplied. The cluster is large, of good shape, compact; berry large, roundish; skin green, with a whitish bloom, becoming amber colored when fully ripe; flesh slightly pulpy, sweet and pleasant, in quality not quite equal to the Concord. In the first stages of ripening it has a foxy odor, which disappears somewhat as the fruit approaches maturity. The vine, apparently, is as hardy, vigorous and productive as the Concord, and the foliage is thick, leathery, and unusually hardy, resisting the effects of extremes of weather to a degree scarcely equalled in any other sort. The special merits of this new variety may be briefly stated as follows: Large, handsome fruit, which is of medium quality, great vigor, healthfulness and productiveness of vine. Although it cannot be regarded as a perfect grape, its introduction goes a good ways towards supplying a long felt want, and cultivators all over the country will welcome it. From a commercial point of view, it will be looked upon as an important gain, and large amounts of money will be and have already been invested in its propagation and dissemination. It ripens September 23d, with the Concord.

*\*Prentiss*—Another of the new white grapes which is attracting a good deal of attention just now, is said to be a seedling of the Isabella. The bunch is of medium size, compact; berry medium, round; skin thick, pale yellow when ripe; flesh tender, juicy, sweet and pleasant. It bears considerable resemblance to the Rebecca, but the clusters are more uniform. It ripened October 1st, about ten days after Rebecca and a week after Concord. It seems to be an improvement on Rebecca, except in flavor and time of ripening.

*\*Lady Washington* — One of Mr. Ricketts' remarkable hybrid grapes, is a cross of Concord and Allen's Hybrid. Bunch very large, shouldered; berry medium to large; skin green at first, changing to pale yellow when ripe; flesh pulpy but tender, juicy, sweet, not rich; vine remarkably vigorous and productive. This is, indeed, a splendid grape, remarkably showy and of good quality, but the season here does not seem to be quite long enough to enable it to become thoroughly ripe. It did not ripen perfectly this season. No doubt it will be very valuable further south, or even in favored localities here.

*\*Pocklington* — Still another of the white grapes said to be a seedling of the Concord, and possessing the vigor, health, hardiness and productiveness of its parent. Bunch medium to large, compact; berries large; skin green, tinged with yellow when fully ripe; flesh pulpy, but sweet and pleasant. This is a large, handsome grape, of medium quality, but it will require favorable seasons and good locations to ripen it satisfactorily in this region.

The following grapes I am not able to arrange in the above list. Some did not mature at all, and the date of ripening of others was not recorded. Hence we will take them up without regard to order.

*Eldorado* — One of Ricketts' seedlings, was obtained by crossing Concord and Allen's Hybrid, that is with the same parentage as Lady Washington. Our plant produced only a small cluster, which was defective in consequence of the fruit not setting well. The berries were of medium size, amber colored, and of good quality, much better than the Lady Washington. It ripened fully ten days in advance of that sort.

*Wyoming Red* or *Wilmington Red* — Originated at Ithaca, N. Y. It is a strong growing, hardy sort, producing medium sized cluster of red fruit, which is pulpy and foxy and of poor quality. On account of its earliness, vigor and hardiness, it seems to be regarded as desirable for some regions.

*Jefferson* — A cross between the Concord and Iona, and originated by Mr. Ricketts, is a handsome new grape, which has been watched with great interest by fruit growers, who

have been expecting that it would prove to be a most desirable accession. It resembles the Iona closely, both in appearance and quality, and relative to the latter qualification, it is difficult to determine which of the two excels. The Iona is more vinous and the Jefferson is richer, having more sugar. The bunch is of medium to large size and shouldered; berries medium to large, roundish; skin thick, light red, with a lilac bloom. It ripened this year after the Iona and with the Catawba; therefore we fear it may be too late for this locality, but sincerely hope that this may not be the case.

*Highland*—Another of Mr. Ricketts' seedlings, is a hybrid between Concord and Jura Muscat. It is a very large and remarkably handsome black grape, but it will not ripen here, a fact much to be regretted, for it would otherwise be a most important addition.

*Burnet*—Raised by P. C. Dempsey, of Ontario, is a hybrid between Hartford Prolific and Black Hamburg. Bunch medium size, somewhat loose; berry large, oval, black; flesh without pulp, vinous, rich. It is a fine and distinctly flavored grape, but the foliage frequently suffers from mildew. Under favorable conditions it becomes a fine grape for the amateur.

*Naomi*—Also one of the Ricketts' seedlings, is a hybrid between Clinton and one of the Muscats. Bunch large, shouldered, compact; berry of medium size, roundish oval, pale green, with a whitish bloom; skin thick, but almost transparent; flesh melting and sprightly, with a marked Muscat flavor. This is a handsome and richly flavored white grape but it does not ripen here in the average seasons.

*Uhland*—A seedling of the Taylor, and a leading white wine grape at the west, is not of any value here. The skin is very tender and cracks, the flesh is pulpy, what is called meaty, nevertheless tender. It yields very heavy crops and bears regularly, and may, perhaps, be useful as a wine grape in some places in the east.

\**Elvira*—Resembles Uhland, but the berry and cluster are not quite so large, and the plant does not yield as heavily.

*Black Eagle* — Is a fine table grape, with a rich sprightly vinous flavor. Bunch medium to large, rather loose; berry of medium size, oval; skin black with bloom; flesh slightly pulpy; vine vigorous and a good bearer; foliage healthy.

\**Janesville* — Is an early black grape from Wisconsin ripening with the Hartford, but not surpassing it in any respect.

*Miner's Seedlings* — We have tried them all without finding a single one in the collection which, in our opinion, deserves to be kept. The Victoria is a good, white grape, but is superseded by others.

*Rockland Favorite* — A black grape from Massachusetts, we do not consider worthy to be retained.

*Triumph* — The beautiful white grape originated by Geo. W. Campbell; will not ripen here, but it is becoming popular at the south.

The question now naturally suggests itself whether any progress is being made in grape culture. Undoubtedly we are making great progress. If we get only three or four really valuable grapes from among the large number now offered, it will be a great gain, and should be satisfactory.

The originators of these new sorts, who have labored so long and patiently, deserve our sincere thanks. We hope that their efforts will receive such pecuniary reward as will encourage them to prosecute their labors in the future. There is still room for much improvement.

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## GRAPES FOR THE NOVICE.

### PLANTING.


Take your vines in a pail with water, or wrapped in a wet cloth, from the place where they were heeled in to the holes. When planting let one person shorten the roots with a sharp knife, then spread them out evenly on all sides and let another fill in with well pulverized earth. The earth should be worked in among the roots with the fingers, and pressed to them with the foot. Lay the vine in slanting, and let its

top come out at the stake previously set. Then with the knife, cut back the top to a bud just above, or even with, the surface of the ground. Do not leave more than two buds on any one of the young vines which you are planting, however strong the tops, or however stout or wiry the roots may be. One cane is sufficient to grow, and merely to be prepared for possible accident, both buds are allowed to start. The weaker of the two shoots may afterwards be rubbed off.

When planted in the Fall, raise a small mound around the vine so that the water will drain off, and throw a handful of straw or any other mulch on the top of the mound to protect it; but do not under any circumstances cover the vine with manure, either decomposed or fresh.

During the first summer little else can be done than to keep the ground mellow and loose about the plants and free from weeds; stirring the ground, especially in dry weather, is the best stimulant, and mulching is far better than watering. A fair growth is about four feet the first summer. In the fall, after the foliage is all off, cut back to two or three buds. Cover the short cane left with a few inches of earth before the ground freezes. If any vacancies have occurred, fill out, as soon as possible, with extra-strong vines of the same variety.

#### TRELLISES.

During the following winter, the trellis should be built. The plan adopted by most of our experienced grape-growers, as possessing some advantages over other plans, especially if grapes are grown in large quantities, is as follows: Posts of some durable timber (Red Cedar is best) are split three inches thick and about seven feet long, so as to be five feet in height after being set; these posts are set in holes two feet deep, sixteen to eighteen feet apart in the rows (so that either two vines eight feet apart, or three vines six feet apart, are between two stakes); three wires are then stretched horizontally between the posts, being fastened to each post with a staple , which is driven in so firmly that the wire is prevented from slipping through. The two end posts should be larger than the others, and braced (Fig. 1), so that the contraction of the wire (in cold weather) will not

loosen them. The first wire is placed about eighteen inches from the ground, and the others eighteen inches apart; this brings the upper wire about four feet and six inches from the ground. The size of the wire used is No. 10 annealed

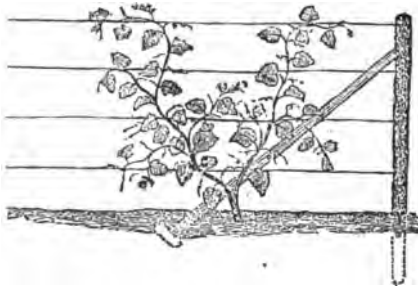


Fig. 1.—Wire trellis, braced, for grape.

iron; No. 12 wire is strong enough. At the present prices of wire the cost per acre will be from \$40 to \$60, according to distance of rows and number of wires used.

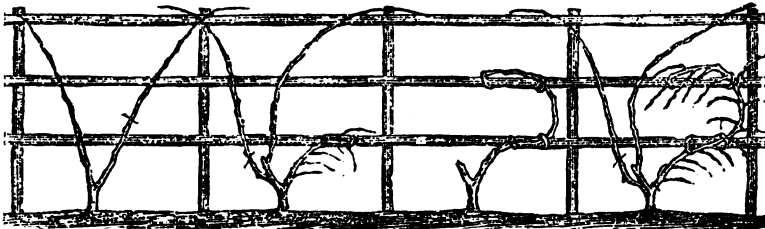


Fig. 2.—Slat trellis for grape.

In place of the wire, slats or laths may serve the same purpose, as shown in figure 2, but they are not durable, and the posts must be put in much closer.

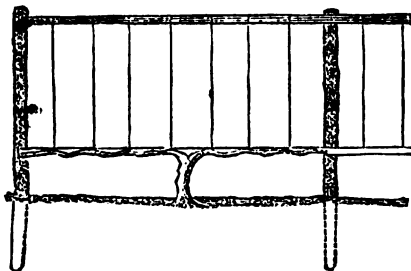


Fig. 3.—Wire trellis for grape, Fuller plan.

Another mode of making wire-trellis (the Fuller plan) is with horizontal bars and perpendicular wires, as shown in

figure 3. Posts of good, hard durable wood, three inches in diameter, and six and one half to seven feet long, are placed between the vines, at equal distances from each vine, and in a line with them, two feet deep in the ground. When the posts are set, nail on strips about two and one half inches wide and one inch thick, one strip or bar being placed one foot from the ground and the other at the top of the posts. Then take No. 16 galvanized iron wire and put it on perpendicularly, twisting it around the lower and upper bar at a distance of about twelve inches apart. Galvanized wire is preferable, and as a pound of No. 16 wire gives one hundred and two feet, the additional expense is but very small. This trellis will probably cost less than one with horizontal wires, and is preferred by some. Practical experience, however, speaks in favor of horizontal wires, and a method with only two horizontal wires, the lower about three feet high and the upper about five and one half feet high, is gaining the good opinion of vineyardists East and West.

A good many grape growers train their vines to stakes, believing it to be cheaper. This method has also the great advantage of allowing us to cultivate, plow and cross-plow the ground in all directions,

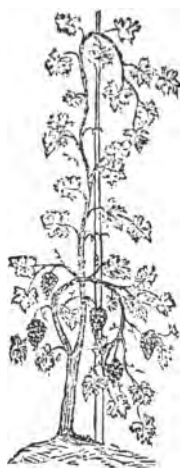


Fig. 4.

leaving but little to hoe around the vines. Some use one stake only, as shown in figure 4, but with our strong growers this mode is apt to crowd foliage and fruit too much; others therefore use two, and, where timber is plentiful, even three stakes around each vine, about ten inches from it, winding the canes around them spirally until they reach the top. The disadvantages of training on stakes are, that these soon rot in the ground, and must be almost annually taken out, repointed and driven into the soil, consequently they require more labor, and are not as durable as a trellis, unless cedar poles are used, or other very durable timber. A

very simple combination of the trellis and stake system, shown in figure 5, is also highly recommendable, requiring

but one wire for bearing the canes, and much lighter stakes, which need not be set as deep into the ground as where no wire is used to hold them, and consequently they will last longer; but by this method one cannot cross-plow.

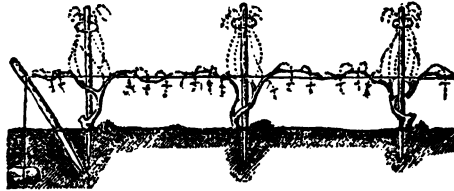


Fig. 5.—Trellis with stake combination for grape.

To secure this advantage, and at the same time to give to our strong growers more space and the benefits of high training, an arbor trellis, such as shown in Fig. 6 may be used. The construction of this is more expensive on account of the necessary high posts (of which the end posts only need be quite strong) and of wire; but the productivity and exemption from disease are also greater in propor-

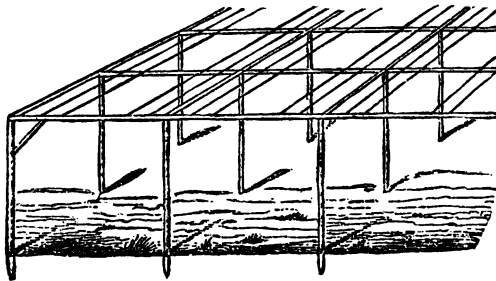


Fig. 6.—Arbor trellis for grape,

tion. By this method the ground might also be used for grass culture, and summer pruning and tying are almost entirely dispensed with. The fruit gathering is, however, less convenient, and none but quite hardy, vigorous varieties should be thus trained.

If you covered your young vines last fall, remove the earth from over them at the approach of spring, as soon as danger from frost is past; then cultivate the whole ground, plowing between the rows from four to six inches deep, and carefully hoeing about the vines with the two-pronged Ger-



man hoe or *Karst*, or *Hexamer's* pronged hoe. The ground should thus be broken up, inverted, and kept in a mellow condition continually; but do not work the ground when wet.

During the second summer a cane or shoot is produced from each of the two or three buds which were left on the vine last fall. Of these young shoots, if there are three, leave only the two strongest, tying them neatly to the trellis, and let them grow unchecked to the uppermost wire.

With the strong-growing varieties, especially when we intend to grow the fruit on laterals or spurs, the two main canes are pinched off when they reach the second horizontal wire, whereby the laterals are forced into stronger growth, each forming a medium-sized cane, which is shortened in the fall to from four to six buds. One of the two main canes may be layered in June, covering it with mellow soil about an inch deep, leaving the ends of the laterals out of the ground. These will generally make good plants in the fall for further plantations; with varieties which do not grow easily from cuttings, this method is particularly desirable. Figure 7 shows the vines tied and pruned accordingly, at

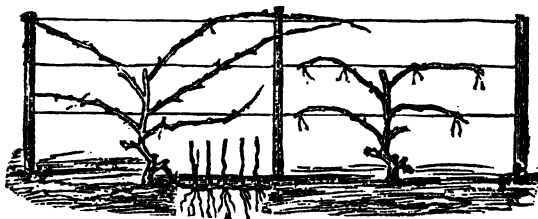


Fig. 7.—Layering a main cane of grape.

the end of the second season; the cross-lines through the canes showing where they are cut off or pruned.

Another good mode of training, recommended by Mr. A. S. Fuller, is to bend down in the fall, at the end of the second season, the two main canes of the vine in opposite directions, laying and tying them against the lower wire or bar of the trellis, as shown in figure 8, and shortening them to four feet each. Then let five or six of the buds on the upper side of the arms be grown into upright canes. All buds and shoots not wanted for upright canes should

be rubbed or broken off. This latter method is not well adapted for varieties which require covering in winter. When the canes are started lower, near the ground, and cut loose from the wire, they can be easily covered with earth.

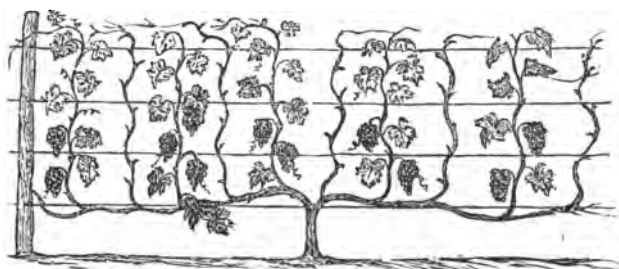


Fig. 8.—Growing uprights from laterals.

At the commencement of the third season, tie the canes to the trellis. For tying, any soft string or stout woollen yarn, or the shreds of old gunnies, may be used; some obtain their tying material from basswood bark, soaked for two weeks or longer in running water. Tie closely, and as young canes grow keep them tied, but in all cases, take care against tying too tightly, as the free flow of sap may be obstructed.

The ground is now plowed and hoed again, as before. Give one (6 in.) deep plowing in spring, taking care, however, not to cut or tear the roots of the vines, and two more shallow (three or four in.) plowings in summer. From each of the buds left at the last pruning (as shown in the preceding figures), canes can be grown during the third year, and each of these canes will probably bear two or three bunches of fruit. There is danger of their being injured by overbearing, on which account the bunches should be thinned out by taking away all imperfect bunches and feeble shoots. In order to secure future fruitfulness of the vine, and at the same time to keep it in convenient control, we would allow no more wood to grow than is needed for next season's bearing, and for this purpose resort to spring pruning.—*Rural New Yorker*.

## RAISING GRAPE-CUTTINGS.

During a recent visit with Mr. Wilson, of Atlantic, Iowa, who raises more grape-cuttings than any other man in the west, he gave his method of raising the thousands of young vines which he sends all over the country. Mr. W. said: "I prefer six or eight inch cuttings with two or three buds on each. My soil is very mellow; being composed of vegetable mould 18 to 24 inches thick, with an underlying stratum of very porous clay. The cuttings are prepared in December, and tied in bunches of 100, with the butts all one way. These bunches are inverted, put in a trench, and covered with 4 inches of mellow soil, which, in turn, is covered with a thick coating of manure; when they are left until spring. As soon as the frost is out of the ground, the manure is removed, and the bunches are left in the trench for some time for the roots to callus. When sufficiently callused, the cuttings are taken up and placed in water 24 hours to get thoroughly saturated. They are then stuck in the ground 3 or 4 inches apart, in rows 3 feet apart. By the aid of a line, in very mellow soil, these cuttings can be put in the ground very rapidly. Good cultivation is given through the summer, and the vines are ready to ship the next autumn and spring. For ordinary soil it would probably be necessary to make holes to receive the cuttings."

This is the method for ordinary varieties. A plan employed by Mr. Wilson for hard-wood varieties like the Delaware, that are difficult to grow from cuttings, is as follows. The cuttings with two or three buds are fastened to two-inch pieces, about the size of a lead pencil, of the roots of some hardy variety like Ives' Seedling or Concord. The vines from which these root pieces are taken must be young and thrifty. The fastening is done by means of grafting wax and thread, wound over and over and the end tucked in. These are packed in the cellar until spring, and then set out. The roots start from the callused portion.— *Prairie Farmer*.

## PRUNING THE GRAPE.

Calling on a gentleman in early spring some years ago I noticed that he had carefully tied his grapevines to the wires of the trellis, and from thence trained them to the side of a building, some of the shoots having fully eight feet of new growth. I asked if he is was not going to trim them. "Oh! I have," he replied, "I cut off nearly six inches of wood." I deemed it my duty to explain to him the process of pruning, and while so doing, properly trimmed a single vine, he unfortunately not allowing me to do more, but insisting on training them in the old way. I happened in the same neighborhood the following fall and found him gathering grapes, and his first words on seeing me were: "Young man, I am convinced I don't know how to take care of my vines. When you trimmed this one I was angry with myself for allowing you to do it, and sorry you was such a fool, as I thought then." On the vine I had trained hung thirteen good-sized, well-formed and well-ripened bunches, while high up on the other vines were fifteen or twenty unripe and imperfect bunches. There exists a natural timidity to use the knife or shears on plants and trees, but it must be overcome if the owner would have a full crop of fine fruit. Grapevines should be pruned during mild days from November to March, while in a dormant state; never defer the work until late in spring after the sap has started.

The grapevine bears its fruit on shoots made the present year, or, in other words, on the new wood. We will suppose we have just obtained our vine from the nursery, two years old. This vine may have one or more shoots, which may all be cut off except the strongest, and this pruned to within two or three eyes of its base, *i. e.*, where it joins the main vine. The second season follow the same course except allowing two of the strongest shoots to remain, which should be bent in either direction horizontally and fastened to the lower wire or bar of the trellis, with soft woollen strings or leather bands. The third year these two shoots will force

out new ones which should be trained upward. After this season's growth cut back the two main shoots to about three feet from the base and the upright ones to a foot from where they join the lower shoots. The fourth year each of the last year's shoots is cut back to within three feet of its base; after this year, when a few bunches of fruit will be had, the spurs should be pruned every winter to about three eyes. Of course it is understood that fruit is what is desired and not wood, and therefore a system of pruning must be followed similar to the one here described. Each fruit-stalk should be allowed to produce two bunches of fruit, and when this stalk has made three to five leaves beyond the last bunch of fruit the end should be pinched off, as must also all laterals which will appear. I consider this system one of the best of the many practiced. In pruning the grape the cut should be made about half an inch above the bud, not close to it, as in hard-wood trees.—George R. Knapp, in *New York Tribune*.

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### THE GRAPE ROT.

Of late years the attention of grape growers has been annually called to a number of diseases of the berry, by which their vintage has been much lessened. As a rule these diseases are known as "the grape rot," and no little anxiety has been felt as to the cause and probable duration of the disease.

I shall try to bring together as briefly as possible the facts which have come under my observation, through specimens and inquiries from various parts of Wisconsin. It is probable that there are other forms of the so-called rot which are familiar to members of this Society, and the main object of my paper is to direct their attention to the subject, with the hope of utilizing their observations in the further study of the diseases of the grape.

Some berries show a discolored spot about an evident injury on the surface, which most frequently appears as a minute puncture, suggesting at once the idea of insect

work. Occasionally such berries crack open, especially in wet weather, as a result of the osmotic imbibition of water by the pulp cells near the puncture.

An examination of grapes affected with this form of the disease shows that they often contain small caterpillars. These larvæ feed on their pulp and seeds. From its resemblance to the larva of the codling moth, this insect (*Eudemis botrana*, Schiff.) has been called the Grape Codling (Fig. 1-2). It is also known as the Grape-fruit Worm and the Grape-berry

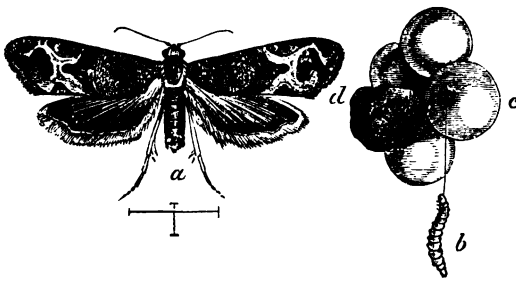


Fig. 1.—Grape Codling; *a*, moth, *b*, larva, as it drops from the fruit, *c*, *d*, injured berries.

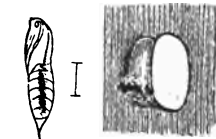


Fig. 2.—Grape Codling; \* pupa and flap of leaf under which it transforms.

**Moth.** When grown the larva deserts the fruit and, as a rule, cuts a little flap from one of the nearest leaves, which it webs over it, after the manner of the Tortricides or Leaf-rollers, to which group of insects it belongs (Fig. 2). In this retreat it changes into a pupa from which the small moth into which it transforms finally emerges. A very good account of its transformation may be found in Prof. Riley's First Report on the Insects of Missouri, pp. 133-6.

The spring brood of larvæ are said to eat the leaves of the grape. It has also been shown† that they sometimes "feed on the tender shoots of the common Iron Weed (*Vernonia noveboracensis*), which they web together for their better protection. When mature they desert these retreats and cut little flaps from the larger leaves, which, folded over and fastened at the edges, protect them during the pupa stage." The insect "has also been bred from larvæ webbing the leaves

\*The cuts illustrating insects are from Dr. Riley.

†Miss Murtfeldt: *Psyche*, 1881, III, p. 276.

of the Tulip Tree (*Liriodendron*), and of the Lead Plant (*Amorpha*)," from which it will be seen that its food is supplied by plants of the most diverse nature.

A somewhat similar injury is caused by the Grape Cur-



Fig. 3.—Grape Curculio; a, front leg of beetle, b, larva.

culio (*Craponius inæqualis*, Say) (Fig. 3.), the larva of which can be readily distinguished from the Codling by being footless, while the latter has three pairs of true legs and five pairs of prop-legs or abdominal legs. When mature the Curculio larva deserts the grape, and transforms in the ground, emerging in the fall as a beetle, in which form it passes the winter.

Other grapes, more frequently seen about Madison, Wis., and received in quantities from other localities, show no sign of insect work, although, as will be seen directly, they sometimes appear punctured. They are commonly more or less deformed, often flattened in places, where they are of a brown or gray color, according to the progress the disease has made. In short, their appearance is much as if they had been scorched on these places, which are usually of rounded outline.

This form of the rot is common on several of the Rogers Hybrids, and appears to be quite similar to what is known in several parts of Europe as Anthracnose. An examination with a hand lens sometimes reveals nothing but a drying of the epidermis. Often small black spots are visible in the gray back-ground. Sections of the spots, passing through these points, show that they correspond to microscopic cavities in the dried skin of the fruit, which contain numerous very small spores or reproductive bodies, characteristic of the fungus *Phoma uvicola* B. and C., which has long been known in connection with the "dry rot" of

the grape. The *Phoma* is so universally associated with this form of the disease in the United States, that it is held by some to be its cause. My own observations are too limited to admit of a positive assertion on this point, but while the *Phoma* unquestionably sometimes develops on grapes which are already diseased from another cause, some specimens certainly show no injury that I have been able to make out other than that due to this fungus.

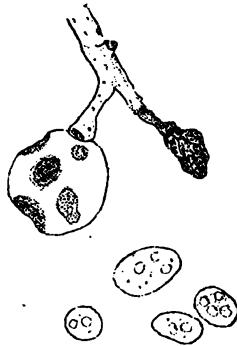


Fig. 4.—*Phoma uvicola*; Grape attacked by the *Phoma*, natural size. Four spores. (+675)\*.

The genus *Phoma*, to which this fungus belongs, is one of a large number of "form genera," many species of which are known or at least suspected to be early forms of fruit of species which, in the winter, appear in other forms, and have often been given other names. Like the larvæ of insects, these imperfect forms can sometimes be watched through their transformations, but the work is much more uncertain and difficult. Whether *P. uvicola* is a good species, whether it is a form of one of the many known grape fungi, or whether it belongs to a species, the perfect fruit of which is as yet unknown, is not certain. Such culture experiments as I have been able to make have yielded only negative evidence.

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\* The specimen from which the figure was made was received from a correspondent in Missouri, and differed from those mentioned in the appearance of the diseased spots, which were of a dull, purple brown. The spores in this case were rather larger than in the typical form of *P. uvicola*, (4–12  $\mu$ , usually 10–12  $\mu$ ) but I should say that the difference is scarcely specific.



Another form of rot which is, perhaps, the most destructive of all in Wisconsin, manifests itself by the shriveling of the berries, either when they are about grown or long before. Many of these fall to the ground, while others remain attached to the plant. So numerous are those that suffer, that what were at first full, symmetrical clusters, finally become reduced to irregular bunches of scattered fruit, and entire clusters are sometimes destroyed.

Berries which shrivel in this way occasionally show one or more livid spots on their surface. In some instances these show no traces of insect injury, but ultimately bear a crop of *Phoma uvicola*. In Canada an injury of this sort is caused by the grape-seed maggot, which I have not yet seen. In his first report, Prof. Riley described this as the probable larva of some curculionid beetle, but it was subsequently shown to be that of a chalcid fly (*Isosoma vitis* Saund.) (Figs. 5, 6). The maggot feeds in the seeds of the grape, one or two of which enlarge considerably, as a result of its attack.

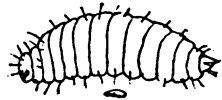


Fig. 5.—Larva of *Isosoma*, natural size and enlarged.

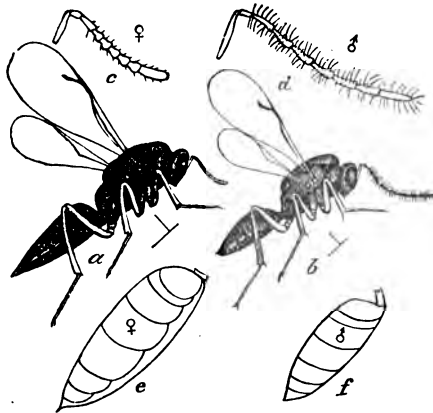


Fig. 6.—*Isosoma vitis*; a, female, b, male, c, antenna of female, d, antenna of male, e abdomen of female, f, abdomen of male.

Last fall, on the invitation of Mr. A. L. Hatch, of Ithaca, Wisconsin, I spent several days at his home in the examination of rotting grapes. The greater number of the diseased berries in his vicinity were simply drying up and

falling, with no external sign of insect attacks. These berries, when cut open, showed quite uniformly a discolored appearance before any trace of injury could be seen at the surface. As a rule, while most of the pulp remained unaffected, a zone of browned tissue could be seen running almost or quite around the fruit between the seeds and the skin. In sections of this diseased tissue I was able to make out the presence of a fungous mycelium, which is evidently that of some *Peronospora*, and possesses the small, round haustoria or suckers of the mycelium which is found in grape leaves attacked by the American grape mildew (*Peronospora viticola*, B. & C.) (Fig. 7). Sections of grapes

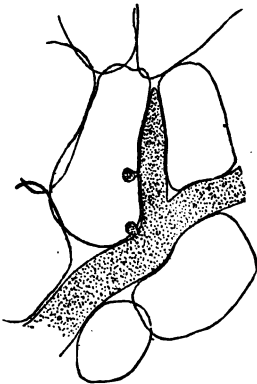


Fig. 7.—*Peronospora viticola*, mycelium in berry, ( $\times 275$ ).



Fig. 8.—*Peronospora viticola*, fruiting threads, from leaf. ( $\times 225$ ).

containing this mycelium were placed in damp air, and in the course of a few days several of them produced a small quantity of the fruit characteristic of this *Peronospora* (Fig. 8).

It appears, therefore, that the most destructive form of the grape rot with us is a direct result of the growth, in the berries, of the fungus which causes the common leaf disease of the vine. This fungus, forming, when in fruit, frosty white patches on the under surface of the leaves, which are browned above in corresponding places, should be familiar to every grape grower; but it is unfortunately the case that many horticulturists do not distinguish it from the *Oidium* or true, mildew of their upper surface.

Heretofore this *Peronospora* has been found only on the vine, fruiting abundantly on the leaves, sometimes on the shoots of the plant, and rarely on the fruit, the epidermis of which, perforated by few stomata or breathing pores, usually prevents the emergence of its fruit-bearing threads. During the past season it has also been found on a near relative of the grape, the Virginia creeper (*Ampelopsis quinquefolia*), in several parts of the West, e. g., in Minnesota by Prof. Farlow, and in two localities in Wisconsin by myself and Mr. L. H. Pammel, one of my students.

From what has been said, it will be seen that what is generally known as "the grape rot" is not one disease, but that it is a generic name, including several well marked disorders. For convenience I append a key that will probably enable any careful observer to determine the cause of either of these, or if there are still others, to determine that fact.

1. Insects not found in the pulp, 2.

Insects found in the pulp, 4.

2. Minute black dots on a dried gray or brown spot,  
*Phoma uvicola* B. & C.

Berries shriveling, not appearing scorched, 3.

3. Berry not punctured, seeds not enlarged, *Peronospora viticola* (B. & C.).

Berry punctured or discolored at one spot, one or two seeds enlarged, containing a footless maggot, *Isosoma vitis* Saund.

4. Larva footless, 5.

Larva with 16 legs, *Eudemis botrana* (Schiff).

5. About  $\frac{1}{8}$  in. long, not hairy, *Craponius inæqualis* Say.  
Less than  $\frac{1}{8}$  in. long, with fleshy hairs, rarely, *Isosoma vitis* Saund.

European vineyards have suffered much of late from related diseases, but authorities have differed as to the cause of some of them. Planchon has found anthracnosed berries infested by the fungus *Sphaceloma ampelinum* De Bary. Passerini has ascribed the injury to *Ramularia ampelophaga* Pass.; while Cornu has traced the disease to the American *Phoma uvicola* B. and C., above mentioned and still others have found its cause in one or other of the

many fungi of the vine. More recently Prillieux, having examined grapes from this country, has shown that in some cases, at any rate, the *Phoma* only grows on tissues already diseased through the previous action of *Peronospora viticola*.

#### REMEDIES.

With respect to remedies for the *Peronospora* rot several points are suggested. In damp, hot weather the fungus spreads readily from plant to plant by means of the spores borne in the frost-like tufts everywhere abundant on diseased leaves; hence it has been proposed to kill these by dusting the affected plants with sulphur, applied by a sulphur bellows. Where the disease is local in its appearance this may prove effectual if promptly resorted to, but it should be borne in mind that the actively vegetating part of the parasite, its mycelium, lives in the interior of the diseased parts, where it is protected from all topical applications, and for this reason can not be destroyed by them like the European *Oidium*. There is consequently no means of reaching the fungus after it has once entered the plant.

The most promising time for attacking the pest is the fall or winter. On the approach of the latter season, winter



Fig. 9.—*Peronospora viticola*, oospores, (×245).

spores (Fig. 9) are produced in some of the leaves permeated by mycelium. These spores fall to the ground with the leaves and lie dormant until spring, when they germinate, the mycelium proceeding from them growing into any young grape leaves

or shoots with which the spores may be brought in contact. Up to the present time these spores, which do not appear to be very abundantly formed in this country, have been found only in the leaves of the grape, but it is possible that they may be equally or even more abundant in the Virginia creeper, so that any measures intended to destroy them should extend to both host plants of the fungus.

It is not only possible, but quite probable, that the careful collecting and burning of all grape and creeper leaves in the fall would so lessen the number of these spores left to germinate in the following spring, as to much simplify the

problem of preventing the spread of the disease by the judicious use of sulphur. To secure any real good this treatment should be adopted by every one who owns a vineyard, and few wild plants of either the grape or *Ampelopsis* should be allowed to grow, unwatched, in the vicinity of valuable cultivated plants.

Bagging the young fruit clusters, a process thought very favorably of by some persons, especially when the vintage of a few choice varieties is to be saved, has been recommended as a preventive of the rot caused by *Phoma*. It will, however, be of little use against *Peronospora*, which usually, if not always, reaches the berry through its stalk, and not by direct surface inoculation. On the other hand, bagging may protect the fruit from its insect enemies if properly done.

The prompt destruction of berries attacked by either curculio or codling, and the suppression of iron weed near the vineyard, with the crushing of any pupæ found under the characteristic flaps made by the codling, will likewise tend to keep these insects in check.

Perhaps some members of the Society may be disposed to test the remedy suggested by A. B. Coleman, in the *Rural New Yorker* for November 3, 1883, viz: the removal of every vestige of vegetation for a distance of at least four feet in every direction from the diseased vine, and the scattering over this part of the soil of enough fresh air-or water-slaked lime to whiten it, repeating the dressing if it be removed by rain.

It has also been noticed that grapes which get much sunlight seldom rot badly; and there is doubtless much truth in the statement of Gen. Clay (*Rural New Yorker*, July 28, 1883), that grapes trained against a wall are less susceptible to the rot than those trained to stakes or trellises; although some exception might be taken to his views of the dyspeptic nature of the disease — Wm. Trelease, in *Trans. Miss. Vall. Hort. Soc'y.*, II.

## BAGGING GRAPES.

Within a few years, the bagging of grapes has occupied the attention of many horticulturists. One who has given much attention to this subject, says: "If the application be made in time the paper bag will preserve the cluster in more exquisite perfection than can be secured in any other way. The grapes come forth luscious and beautiful enough to amaze Nature herself."

*When to bag.*—The only safe rule is to apply the bag as soon as the cluster is formed. If delayed too long, the spore of disease may have attached itself to the berry and result in rot. Some have applied the bag before blossoming has taken place. As the new shoot is very tender and brittle, great care must be exercised not to break it.

*How to bag.*—Take manila or any other paper bags; cut off the upper corners in order to wrap the upper portion around the cane; place the cluster inside the bag, wrap the bag around the cane, and then pin it.

*Size of bag.*—This depends upon the usual length of the cluster, and whether more than one cluster is placed in a bag. A two or three pound bag is sufficient for most single clusters.

*Results of bagging.*—The cluster will average larger, ripen later, color in general better, produce larger berries, and the bloom will be preserved more perfectly than in those not bagged. As to flavor, opinions vary, some think it is better, others that it is not improved.

*Bagging as a prevention of rot.*—If applied early enough, it is a prevention. Rot is found in some cases in the bags, but mostly takes place after the grapes are ripe.

*Bagging as to the splitting of the grapes.*—Many of the thin-skinned varieties split badly in the bags. The Elvira, which, out of bags, splits so badly as to be comparatively worthless, owing to the crowding of the berry in the cluster, also does the same in bags.

The Duchess keeps its color when bagged; Delaware, as

a general rule, becomes deeper; Brighton, lighter in color. Niagara improves in color and flavor.

The present summer many will bag grapes by way of experiment. It is doubtful if bagging will become general in vineyard culture, as the extra expense incurred thereby is not made up in the sale of the fruit. To the ordinary purchaser of grapes in the market, fine clusters, large berries, pure color and bloom, and exquisite flavor are secondary considerations. To the amateur, or those who enjoy to sit under the shade of their own vines, however, these qualities are precious; and, as the experiment of a few bunches requires but little time and expense, it is well worth a trial by those who grow grapes for their own use.—J. B. Rogers, in *American Garden*.

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#### WHAT OTHERS SAY.

Take any paper bag 7x10 inches or thereabouts—cut down the sides a little, slip in the bunch, fold the top over the cane and pin together. Leave it until the first slight frost.—*Rural New Yorker*.

Acting under the *Rural's* instructions, I bagged\* 600 bunches, embracing 30 varieties of grapes. The difference was so marked in comparison with the exposed bunches that I hope to bag 1,000 bunches next year, for in spite of severe frosts the quality of the grapes holds good at this date within the bags upon the vines, and the grapes would have been lost or ruined without their paper covering—G. W. P., in *Rural New Yorker*.

A correspondent asks for advice on the propriety of bagging grapes. The advantages are, protection from insects and birds; to some extent exemption from rot when that disease prevails; but more particularly in the fine appearance which the bunches present by freedom from external injury and with the undisturbed bloom of the berries. Sorts which sell at high prices pay for the expense of bagging; common grapes do not. Where performed for profit, the work must be systematized, the bags made by wholesale

methods, and the persons who apply the bags must understand the business of applying them rapidly. As the bags retard somewhat the ripening, the grapes keep longer and may be supplied to purchasers for a longer period, and the bags afford some protection from autumn frosts. To prevent rot, the bags should be applied soon after the fruit sets, or before it is half grown; otherwise the operation may be deferred till nearly the time for coloring. Manila paper is the best material, and the upper fold should be drawn over the bunch and pinned, so as to form a roof to exclude rain. Sometimes bagged grapes have been badly injured by long rains through the bags retaining moisture and causing cracking of berries. Time will determine to what extent the practice will ultimately prevail in vineyard culture.—*Country Gentleman*.

The utility of this practice is not yet settled by grape-growers generally, nor the best time ascertained in the season when the work should be performed. External influences vary, and give diverse results. The operation will hardly pay when the fruit sells at low prices. The same reason does not exist in all localities in favor of bagging. Growers can arrive at the most satisfactory conclusion as to its utility by making a fair trial. Caywood says the bags may be ordered from any paper warehouse, and that two-pound manila bags cost \$1.80 per 1,000.—*Country Gentleman*.

The common two-pound paper bags, as used by grocers, such as can be obtained in most towns at about \$1.75 per thousand, are suitable for protecting bunches of grapes of the average size. Turn the top down, all but the corner where the stem of the bunch passes in, and one pin will at once make it secure against birds, insects and too easy temptable eyes. Applied early in June, there is little danger left from flying spores. The grapes look fairer, are sweeter, and keep better when thus incased. They can be left longer on the vine to ripen the more fully.—Experience, in *New York Tribune*.

Simply inclosing the bunch, when fairly formed, in an or-



dinary paper bag, and tying a string loosely around the stem, or fastening with a pin, has decided advantages. Insects are prevented from puncturing the fruit. The berries color and ripen more evenly; the various forms of fungi do not attack, and the owner in most cases is rewarded with a nice crop of fruit when otherwise he might not obtain a perfect specimen.—*New York Tribune*.

The bagging of grape bunches, and again the unbagging, is too much of a job for the indolent, but it has all the good effects that Mr. Hoopes describes, besides the great merits of protecting the berries from birds, etc., and of allowing of fuller ripening, and making the keeping of the fruit for Christmas use an easy matter—nothing more being requisite than leaving the baskets of grapes in the bags undisturbed in a cool room, dry, yet not sweepingly dry.—*Quis Quis*, in *New York Tribune*.

During the discussion of the New Jersey Horticultural Society, it was stated that carbolic acid was an effectual remedy for grape rot, and that an ounce dissolved in five gallons of water, and sprayed over the bunches when the rot appears, will stop its farther progress. In this connection Secretary Williams said he bagged all kinds of grapes with success. Three-pound manila bags cost from \$1.15 to \$2 a thousand, and he paid \$1 a thousand for putting them on. E. P. Beebe said that the bags should be put on as soon as the grapes had formed; but he did not think the operation would pay when the fruit sold for less than ten cents a pound.—*Country Gentleman*.

*Paper Bags and Pins*—I am more than ever pleased with the effects of using paper bags on grapes. Not so much on account of their preventing rot in a great degree if applied early in June, or of their wholly precluding the serious loss by bird ravages, as for the perfect condition in which the fruit keeps, entirely free from mould and fresh and beautiful as when picked; and with no trouble at all but that of putting the grapes, while still in the bags, on shelves or in suspended baskets in an airy, cool, dry room. The bags can

be used as effectually a second and often a third season, and so may the pins. These get rough with rust, but if put into a bottle and covered with dilute muriatic acid (about two-thirds water) for ten to thirty minutes, until the rust spots are eaten off, they will be smooth and sharp as ever. Many rinsings with water are necessary to remove the acid, which would otherwise continue to corrode the pins. Its effects while present, will be seen by bubbles of hydrogen forming on the pins and rising through the water with quick ascent. This gas is separated from the water by galvanic decomposition in presence of the immersed tin and iron. The pins may be kept dry, or, better, stored in a bottle of kerosene until wanted again next June.—Hortus, in *New York Weekly Tribune*.

*Paste*—A water-proof paste is made as follows: mix rye flour to a thin cream with water and boil it to a paste; add an equal quantity of common glue reduced with water so as to make a thin jelly when cold. Make this hot and mix thoroughly with the hot paste; then stir in it one ounce each of linseed oil, turpentine and common varnish to the pound of glue. The reason why grocers' bags resist moisture is the toughness of the paper rather than the paste used: this is made of rye flour paste to which galbanum dissolved in cold water is added.—*Rural New Yorker*.

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## FERTILIZERS FOR GRAPES.

Experiments with commercial fertilizers in vineyards, continued for four years in the Rhine district, have given encouraging results, showing that such manures can be profitably substituted for stable manure, as to effect both on quantity and quality of the fruit; although in general no important advantage over stable manure is gained. Nevertheless it may be comforting to those who cannot get for their vines all the stable manure they would like, to know that by judicious use of superphosphates, potash, salts and nitrogen compounds, they may be able to get with the same

outlay as for stable manure just as good crops, and often better ones. It was observed in these experiments that less favorable results were obtained with white than with colored grapes. The explanation is given that white grapes are deeper rooted, and that the manure should have been put in deeper to get the same results. The best manner of applying the fertilizer was found to be to make, with an iron post-hole bar, narrow, oblong excavations about eighteen inches deep, at short distances from the vine, and to sprinkle in each hole four or five ounces of the manure; four or five such excavations may be made around each vine, and they are left open to collect the rain for the solution and distribution of the plant food; the application is made late in fall or early in spring. A mixture containing 6 per cent. of soluble phosphoric acid, 6 per cent. of potash as sulphate, and 3 per cent. of nitrogen as ammonia salts or nitrate, has given the best results; for deeper-rooted grapes the nitrogen is better applied in the form of nitrate so that when taken into solution it may sink deeper.—Dr. G. C. Caldwell, in *New York Tribune*.

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## GRAPE SAYINGS.

### FROM VARIOUS SOURCES.

It is well for beginners to know that when they set out grape-vines they need not look for abundant crops in less than four years.

Prepare the ground in fall; plant in spring.

Plant vines before you set trellises.

Give the vine plenty of manure, old and well decomposed, for fresh manure excites growth but does not mature it.

We all like well mannered dogs because of their friendliness, which flatters our self-love, and their lively show of gratitude for good treatment. A recent writer cuts deep when he offsets this by the remark that tens of thousands of homeless, friendless, little children would be grateful too for like care and keeping. An excellent suggestion is that of "inserting a few cuttings of dog under newly set vines or

trees." Equally good for old vines, placed anywhere within reach of their long roots. This is more effective in every way than pulling the dogs', canines — poor creatures!

Luxuriant growth does not always insure fruit.

Dig deep, but plant shallow.

Young vines produce beautiful fruit, but old vines produce the richest.

Prune as soon as the leaves are dead in autumn to insure growth; but in spring to promote fruitfulness.

Those who prune long must soon climb.

Prune spurs to one developed bud, for the nearer the old wood, the higher-flavored the fruit.

Grape-vines bear their fruit on the current year's canes, growing from the previous year's wood, and the principle of pruning is to leave only such an amount of last year's wood as shall produce a proper number of bearing canes, and not so much fruit as to be unable to ripen it, and the wood for future productiveness. The most approved method in pruning now is to cut away most of the bearing wood and depend upon renewing the bearing arms for the next season.

Vine leaves love the sun; the fruit, the shade.

Every leaf has a bud at the base, and either a bunch of fruit or a tendril opposite it.

A tendril is an abortive fruit bunch,—a bunch of fruit, a productive tendril.

A bunch of grapes without a healthy leaf opposite is like a ship at sea without a rudder—it can't come to port.

Laterals are like politicians—if not checked they are the worst of thieves.

Tie a cord *tightly* about several grape-vine canes just below a good-sized bunch. This will not prevent the flow of sap to the bunch, but it will impede its return and cause the berries to grow larger.

Complete maturity of the grape is indicated by the concurrence of the following signs: The stem of the bunch turns from green to brown; the bunch becomes pendant; the berry has lost its firmness; the skin has become clear and translucent; the berries are easily separated from the skin; the juice of the grape has acquired an agreeable

flavor; has become sweet and glutinous; the seeds have become void of glutinous substances. These are the signs given by several French authors, and are here taken from Prof. Du Breuil, who says, nevertheless, that under some circumstances the grapes should be gathered before arriving at the state of maturity indicated by these signs, and under other conditions should be gathered even later.

"Shall we continue to plant the Concord as a market grape?" This is one of the questions to be discussed at the next meeting of the Western New York Horticultural Society. "Straws show which way the wind blows." With our present experience and convictions we shall never, for any purpose whatsoever, except, it may be as a stock for other varieties, plant another Concord.—Carman.

Favorable stories have been told in our western societies for a number of years past in regard to the hardiness of vine, perfect leaf and high character of fruit of the Worden. Slowly, without undue puffing, it has made its way, on its own merits, from point to point until now the word comes from a thousand sources that it is the king grape of the Mississippi Valley, at least north of Missouri. The call for vines will be immense until such time as our people are sure that we have something better. Persons in the east, who have a low opinion of its quality, should defer final judgment until they have had a chance to eat a few bunches ripened in the hot, dry air of Illinois and Iowa.—Professor Budd.

No trumpeting was ever done to boom up the Worden grape. It has gained a topmost place in the estimation of growers, solely by its own quiet annual exhibit—to those who have the true sort—of its distinct and decided superiority to its great parent, the Concord. No mother and daughter were ever more alike than they are, but the daughter is the princess.—Hortulanus, in *New York Tribune*.

Early in June rose bugs on grapevines begin to appear and there is no use trying to get rid of them by the application of any substance that will not at the same time destroy

or nearly ruin the fruit. The only efficient thing is hand-picking and crushing, or drowning in a mixture of creosote and water. At first this may be no trifling job, but the number will usually grow less and less every year, and finally become almost extinct. After the third season of their appearance very few came on my vines, and I hope in the fourth (the present, with me), none will be found. If suffered to remain, they finally drop to the earth, bury themselves there, and propagate a new and increased brood to come forth suddenly, and nearly all at once, the following year.—A. B. Allen, in *New York Tribune*.

Mrs. L. N. Bonham repelled rose bugs by hanging under her grape-trellis open bottles of bi-sulphide of carbon. The theory, as explained in *The Ohio Farmer*, is that the pronounced odor of the drug is offensive to the insects, which are partial to flowers of delicate perfume.

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### GRAPE DODDER.

Insects, numerous as they are, are not the only enemies with which the grape grower has to contend. The dreaded mildew is a microscopic parasite plant, and now we learn of another plant, also parasitic, but by no means microscopic. S. F. Blackman, Ocean county, N. J., in pruning his vines, came across a "singular growth," which he sent us. The affair is properly described as a "growth," but it is not of the vine, but upon it. It is a cluster of seed pods of a species of dodder—*Cuscuta*, of which there are one or more species found all over the country. The dodders germinate from seeds in the ground, throwing up long slender, leafless stems, which twine around and climb up the stems of other plants. There soon appear upon the stem of the dodder little disks or "suckers," which penetrate the stem of the other plant and through which it robs its host of its juices.

Having established itself, the dodder, finding it easier to steal its food than to prepare it, has no further need of a

root, and soon severs all communication with the soil. It bears minute whitish flowers in clusters, which are succeeded by small pods, each usually with four seeds. The flowers and fruit, though small, are interesting in their structure, which places the plant in close relationship with the large and showy morning glories, both belonging to the same family.

Some of the dodders are common in damp places, and in summer their orange-colored stems, like masses of tangled yarn, are quite conspicuous. The origin of the botanical name *Cuscuta*, is not known, but Dodder is the plural of *dodd*, the word in the Frisian language for bunch.

From the manner in which the plant subsists, it is most injurious to those plants on which it grows. The Flax Dodder and the Clover Dodder of Europe, are often destructive to the important crops they infest. The first named has been introduced into this country, but is not at all common. There is a Dodder which infests the Alfalfa or Lucerne, the important forage crop of California and other far western states, and which was first determined and figured in the *American Agriculturist*, in December, 1874, as *Cuscuta racemosa*, var. *chiliana*.

The three species already referred to form loose flower and fruit clusters, which present a very different appearance from the one now sent, in which the pods are closely crowded in a dense mass, that is sometimes two inches in diameter. It is a native species (*C. compacta*) and the only one of about a dozen belonging to the Atlantic states that attacks cultivated plants. We have known it to injure young apple stocks in a nursery, but its occurrence on the vine is quite new, and, though not likely to prove serious, should be known to the vine growers that they may destroy it wherever it occurs. By rubbing off the flower clusters, before the seeds are formed, it may be kept in subjection without much difficulty.—*American Agriculturist*.

## HORTICULTURE AT NEW ORLEANS.

By J. C. PLUMB, Committee of Collection.

It is not within the province of this paper to give a full account of what was the largest exhibition of fruit the world has ever witnessed, therefore, I will briefly give its outline features, leaving the details to be found in published records of the great exposition.

## THE PLACE AND OCCASION.

At the most southern of the large commercial centers of our country, near the lower edge of the great Mississippi basin; latitude 30°; in a sub-tropical climate; where is perpetual summer (when the sun shines). It was under the auspices of the Cotton Centennial and World's Fair, and in connection with the annual meeting of the American Horticultural Society, thus bringing foreign countries to compete with our own, as well as the states of our own country into a competition never before so extensive.

It also brought together the best skilled and most energetic practical horticulturists of our country to set up the show, as well as a great number of studious visitors who found this the main attraction.

## HORTICULTURAL HALL

is 600 feet long and 100 feet wide, with transept wings at the center, 100 feet by 50 feet each side, giving an entire area of about 70,000 feet. It is a light airy structure, the frame mostly of wood; a grand arch, glazed throughout with heavy glass on a plan new to this country. The height of this arch is throughout about 50 feet, with a central tower 100 feet high, under which there is a grand series of fountains which give a most refreshing coolness when the mercury reaches into the nineties. There is also the hot house, where the tropical plants are especially cared for. The entire margin of this hall is thickly set with growing plants in great variety, mainly from Mexico and the West Indies,



while the central portions are occupied with tables for the display of fruit, and the whole floor area is paved with shells from the gulf.

The objects which first take the eye of the visitor from the north are the great variety of strange plants from the tropics. The cocoanut palm, 45 feet high, loaded with fruit in different stages of growth, the giant cacti, 30 feet high and one foot in diameter; the graceful banana and odd looking orchids, the latter of which being "air plants," are hung on the walls of the hot house with only a bit of wood to cling to. Here we find plants arranged in groups and families, the rare and the new with those more familiar, all interesting and instructive to the botanist and florist. But the center of attraction was

#### THE GREAT FRUIT SHOW.

California first came to hand with 1,045 plates and 90 varieties of apples; 120 plates and 10 varieties of pears; 21 plates and 7 varieties of quinces; 177 plates and 18 varieties of grapes; 78 plates and 5 varieties of lemons; 30 plates and 8 varieties of persimmons; 10 plates of oranges and 10 of pomegranates, with medlars, Italian chestnuts, English walnuts, filberts, almonds and other nuts. Oregon and Idaho came in for a share of the prizes for Pacific coast apples, in smaller lots.

The show of Citrus fruits from Florida and Jamaica was grand. At one stage of the exhibit there were 10,000 plates of these fruits on the tables, embracing the common oranges and lemons of commerce, with a great variety of the fruits of the tropics seldom or never seen in our markets.

But the chief point of attraction was the great display of the prince of all fruits,

#### THE APPLE.

As we enter the main door of the great conservatory we come first to Wisconsin's large display of 1,000 plates and 250 varieties of apples; then Iowa with 125 varieties and 500 plates; Michigan, 200 varieties and 400 plates; Illinois, 250 varieties and 1,000 plates; Pennsylvania, 120 varieties and 150 plates; Ohio, 100 varieties and 200 plates, with lesser

displays by Maine, New Jersey and other states, while Nebraska with 75 varieties has a spread of 500 plates, which is less than half what they had on the tables before the competitive show began. Minnesota shows only grapes, 13 varieties of which are here in excellent condition, while her apple display is confined to her state exhibit.

At the other end of the hall the magnificent display of apples from the southwest made sharp competition between Kansas, Missouri and Arkansas, and the honors seem about equally divided. Kansas shows 130 varieties and 1,000 plates; Missouri, 134 varieties and 500 plates; Arkansas, 160 varieties and 400 plates, all of which are of wonderful size and perfection, which shows that these states are to lead the country in apple growing. Colorado comes in here with 80 varieties of beautiful apples of medium size, grown near Denver, with irrigation, which are very perfect in form and color, and, with the small collection of big apples from Idaho, are a great attraction.

It is remarkable that these states show fall and winter varieties in about equal condition, after four months of packing and repacking and rough handling that would break down the same varieties grown with us. This is doubtless owing to the uniformly cool and clear weather in which they grew, and which gives them a delicate complexion and tough mealy flesh.

The pears and quinces seem all that could be desired. We find here samples of new President pears, of which one measures five by eight inches, weight, two and three-eighths pounds, the plate of four weighing nine pounds. While viewing this grand spread of fruit, Joaquin Miller remarked: "More gold in the apples of California than in her mines."

Of the foreign exhibits England showed two hundred varieties of apples and France fifty varieties in fairly good condition considering their long voyage and custom house delays; but in size and general appearance they could not compete with our western apples. The pears from France, by two exhibitors, were remarkably fine, consisting of over one hundred plates, and in fair condition. A collection of apples from Russia, of ten varieties, was of much interest

to northern men, but little could be judged of their quality, as they were mostly past their prime. Mexico showed only two varieties of apples, both small and sweet. Canada, by Charles Gibb, showed some high-colored apples of small size as compared with our own of the same varieties. Minnesota took several prizes on grapes, having twelve varieties in good condition.

New Jersey and Massachusetts had each some five varieties of pears, of which the Kieffer was conspicuous.

The competitive show of apples grown north of latitude 40°, was from five State Horticultural societies, namely: Iowa, Illinois, Wisconsin, Nebraska and Ohio. For the exceedingly well grown and carefully selected collection of the Iowa society, that state took the prize on "best collection, not to exceed two hundred varieties," with fruit mainly from the southwestern portions of the state. For the "best one hundred varieties," our society took the prize, with Illinois competing.

The "best two hundred by individual exhibitor" was given to A. C. Hammond, of Warsaw, Ill., against competition from Iowa, Wisconsin, and Pennsylvania, and "best one hundred" to J. T. Johnson of the same place.

"Best fifty" was awarded to E. M. Griffin, Iowa, against Wisconsin, Ohio, Illinois, Nebraska, New Jersey and Canada, a total of nine competitors.

"Best twenty-five" was given to G. B. Brackett, Iowa, against thirteen competitors.

"Best ten" to Geo. Seagrave, Spring Lake, Mich., against fifteen competitors.

"Best five varieties" to J. M. Smith, Wisconsin, against fifteen competitors.

Among the lesser premiums awarded, Wisconsin took those for 3 autumn, 5 autumn, 5 winter, 10 winter. That for "largest and handsomest" was awarded to Wm. Springer, on Wolf river, against four competitors. This variety also took the prize for "best new autumn apple" against three competitors. Geo. Peffer took the prize on collection of crab apples against Minnesota and Iowa. On "single plates," Wisconsin took the prize on Alexander, Blue Pearmain,

Colvert, Duchess, Golden Russet, Fameuse, Herefordshire Pearmain, Longfield, Melon, Marsden, Pewaukee, St. Lawrence, Tallman Sweet, Walbridge; and Winter Nélis Pear.

A careful analysis of the awards shows that out of the forty-nine entries for our state, we took twenty-nine premiums on fruit.

For further details of this grand competitive exhibition, I must refer you to the final report from our President, Commissioner Smith, to whose persevering labors our state owes much of its success in this and other departments of the great exposition.

Here I would also gratefully mention the cordial sympathy and free contributions of a large number of fruit growers of our state, who responded so promptly to our appeals for their "best fruits." The following data only are at our command at present:

Wm. Springer, of Waupaca county, furnished 15 varieties of grafted, and a large collection of the seedling apples of that county, about 125 varieties, many of which, from their beauty, added largely to the display; Geo. P. Pepper, also a large collection, which not only helped the state show, but won several prizes to him; Geo. Barnard, Esq., of Plymouth, Sheboygan county, and Mr. Eastman of the same place, sent fine collections; Joseph Plum, Stockbridge, 50 varieties; C. Hirschinger, of Baraboo, 33 varieties; R. B. Bones, of Racine, 20 varieties; E. W. Daniels, Auroraville, 20; Henry Floyd, Berlin, 15; H. Smith and Mr. Daugherty, Green Bay, 30; F. C. Curtis, Rocky Run, 20; also small collections each, from A. J. Philips, Geo. Jeffery, D. Huntley and others, and an especially fine one from Theo. Borst, Esq., Kilbourn, and a small collection of Russian apples from C. Perry of Beaver Dam. We secured choice specimens at several of our fairs, state and county. At the Ripon fair we were greatly assisted by H. W. Wolcott, and at the Walworth county fair by friend Phoenix. But we found that very few specimens so gathered were available at this winter exhibition, except as a guide to secure further selections later on.

The final showing of our state in this department will remain a monument to the faithful efforts of those in charge,

as well as to our resources in apple growing. The following official report will show how we stand in comparison with other states:

## FRUIT.

## North of Parallel 40° North Latitude.

Wisconsin.....	29	\$445	.29	Silver	7
Iowa.....	14	380	.25	"	2
Illinois.....	13	355	.24	"	1
Minnesota.....	12	100	.07	"	3
Michigan.....	9	55	.04	"	1
Vermont.....	1	50	.03	"	1
Nebraska.....	7	35	.02	"	0
Ohio.....	5	30	.02	"	0
Connecticut.....	1	25	.02	"	1
Maine.....	4	20	.01	"	0
Canada.....	2	10	.01	"	0
Pennsylvania.....	1	5	.00	"	0
Total.....	97	\$1,510	1.00	"	16

## OTHER AWARDS.

## TREES.

Wisconsin, 14 Premiums, \$300. 1 Gold and 8 Silver Medals.

## OUTSIDE VIEWS.

One feature of the Exposition not generally noticed is the great variety of trees, shrubs and plants which are now in place in various parts of the park. Many of the states have their individual plant of trees from their home nurseries and forests, which, in compact groups, but with plenty of room for years of growth, are here to show their adaptation to this climate and soil. Among those several and distinct collections none other equals that from our own state in the eyes of professional growers, in variety and perfection, which is due largely to the good judgment of our Mr. Peffer; who made and forwarded the collection.

These groups are to remain as a permanent investment by the several states in this now to be popular resort, and their success or failure will be watched with interest.

In addition to the above mentioned, there are large plats of flowering plants and shrubs which will be in full bloom in the course of a few weeks. There are also long stretches of borders filled with bulbs, thousands of which are showing their varied bloom. One million of the flowering bulbs were

furnished by one firm, whose card is modestly displayed along the borders. This outside work of tree planting has been under the superintendence of Governor Furnas, of Nebraska, with the assistance of Professor Tracy, of the Missouri Agricultural College.

## LESSONS.

1st. Winter in the Sunny South means great extremes of climate — from 32° to 80° — frequent changes of temperature. The air surcharged with moisture, and rainy days the rule for two months at least.

2d. These conditions are so favorable to the spread of fungoid growths that only those fruits with tough, waxy, outer covering can be safely grown and handled in that climate.

3d. That all fruits in that climate should not only be carefully wrapped, but in well ventilated cases, with the most perfect non-conducting packing possible.

4th. That in the words of our friend Stickney, "there is more money in growing apples in Wisconsin, than oranges in the south, not excepting Florida."

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## TRUNKS OF APPLE TREES.

Throughout the northwest, orchardists have found, especially during the last three years, the trunks of apple trees, in one way or another, seriously injured or diseased. Sometimes the difficulty is limited to a small area, and sometimes extends so as to ultimately kill the tree. Thousands of apple trees have in this way perished in our own and adjoining states. It seems that no kind, age or size is exempt, though some varieties upon the whole suffer less than others, and on some kinds of soils and exposures less damage occurs.

In studying the matter somewhat closely, four principal kinds of injury have been found, viz.: by insects, by rabbits and mice, by blight and by frost. Of the first and second nothing is to be said in this place, except to mention the wood borers and the so-called "woolly aphis" as the insects specially referred to. The third must also be dismissed with

a few words. I have elsewhere argued that the so-called "sun-scald" is really blight, produced by bacteria, and this opinion is here further insisted upon, a large number of recent examinations making it impossible to do otherwise. In this case the bark adheres firmly to the wood, at least until it is quite rotten. Not unfrequently new bark forms beneath the old, and so heals the wound and saves the tree. The injury occurs on any part of the trunk and on any side, but is much more common on the south or southwest side, and a tree that leans to the northeast is much more liable to suffer. This is the reason that many have attributed the damage directly to the sun, and have kept in vogue the popular name. In one sense the effect of the sun is a cause of the mischief; but it may be confidently asserted that the injury now considered is in no sense a scald, produced by heat. The same thing can be artificially brought about by inoculation with blight bacteria—has been done—and the inoculations succeed as well on the north as on the south side. But the influence of the sun upon the outer bark of trees is well known to every one who has frequented the woods without a compass, and to every one else who has been sharp in his observations. The outside corky envelope, old and dead, is much more deeply cracked and furrowed on the south than on the north side, and it does not usually take long to discover if one looks, especially in early summer, that many of these cracks extend to the living cells, which are thereby exposed to the contagion of blight. So long as the bark of young trees remains smooth, and is otherwise free from wounds, we do not find this affection of the trunks. When trees lean from the sun the rays of heat fall more nearly at right angles to the surface, and are thus more effective in destroying the elasticity of the outer protecting bark. Rains, too, may more readily wash fine material into the cracks and thus in numerous cases be the means of infection. Beginning from without, it is not very uncommon for blight to be confined to the living cellular layer outside of the bast. In case the cambium layer is not invaded, new bark may be formed and the tree saved, as already said. Evidently keeping the tree erect or leaning

to the south west, and providing a shield of some kind, winter and summer, to protect the bark from drying and cracking, are protective measures, and they are the best we have.

We pass now to the fourth cause of injury, namely, freezing, and shall enter more into detail.

The injury due to frost, so far as the trunks of our trees are concerned, is of two kinds. In one case the wood and bark are split so as to gape open while frozen, though the crack may be closed after warm weather comes again. Sometimes only the bark thus cracks, and then there is left a more or less considerable wound, which becomes much more evident as the new layer of growth pushes out the torn edges. These cracks are much more frequent on the south or southerly side, but sometimes are otherwise located. Numerous kinds of trees are known to suffer in this way, and among others the following have, in my observation, been quite commonly cracked: apple, sweet cherry, plum, box-elder, hard maple, butternut, iron-wood (*Carpinus*), chestnut. Occasionally the black walnut, white willow, tulip poplar, several oaks and the linden have been similarly burst. No doubt the list can be greatly extended. But this form of injury is not nearly so destructive as the next to be mentioned. Trees are rarely severely checked in growth, and probably never killed through this cause alone, though the wound may be deep and long and slow to heal.

The second form of injury by frost is from the separation of the bark from the wood, occurring for the most part near the ground, and also usually most common on the side next the sun; but very often — much more so than in the former case, seen on any side or entirely around the trunk. This is the injury which has been most disastrously destructive in the apple orchards throughout a wide area of our country within recent years. It no doubt occurs in other trees, but I have seen it, since specially looking for it, only in the apple and the white willow. When only the bark cracks, as in the first form of injury, a bare strip of wood is often exposed by the shrinking of the bark and by subsequent enlargement of the trunk by growth; but this need not lead any to confound the kind of injury directly done by frost



with that now considered. In the latter, the bark may or may not be split, usually not in any conspicuous degree; but separation from the wood is more or less complete over the affected area. Very often there is for months no external evidence of the injury, and the sickly appearance of the leaves, perhaps after mid-summer, first attracts attention. The bark itself is not always killed, and there occurs an irregular growth of wood on the inner side but separate from the older wood-layers.

The same sort of separation sometimes occurs between the annual layers of wood, and what are called "wind shakes," are often no doubt really due to frost acting in the manner now described. Sometimes these injuries take place in very old and very large trunks, but whether the splitting occurs near the surface and is afterwards thickly covered by other layers, or occurs in the heart-wood as such, is not known to me.

Having thus endeavored to describe the injuries, I now attempt an explanation, based to a considerable extent upon studies bearing directly upon the problem, but admittedly inweaving more or less of theory, and thus liable to be partially incorrect. In the first place some facts need to be stated.

Water freezes at the temperature marked by 32° in Fahrenheit's thermometer; that is, the exceedingly minute, ultra-microscopical, but solid and firm particles (molecules) composing liquid water, at this temperature arrange themselves in certain regular positions with respect to each other, and cohere so as no longer to be, as before, freely movable upon each other. What was a liquid is now a solid, though the component molecules are not in themselves changed in respect to composition or hardness. They have simply arranged themselves in regular and fixed order, like the bricks of a tower, and a crystal is the result. To attain this arrangement more or less of molecular movement is required, and anything whatever that tends to prevent this movement tends to prevent the water freezing at the temperature stated. Indeed, only pure water freezes at the degree marked on the thermometers. If a little salt or

sugar is added, the temperature must be below  $32^{\circ}$  Fahr. for crystallization to take place; and the lower, the greater the proportion of salt or sugar. Water, saturated with salt, may be cooled down to  $4^{\circ}$  Fahr. before ice is formed. When ice is produced on such a solution, it is, as before, the arranged molecules of water which form the crystal, the foreign molecules being excluded from the structure. The ice is therefore pure water, save that impurities may be mechanically caught and held among the crystals.

Passing now to another series of facts pertaining to the structure of the solid parts of organic bodies, it may be first stated that water forms an essential part of the texture. In plants, with which we are now concerned, all the solid parts are composed of cells usually only to be seen with the microscope. These cells have walls or sack-like membranes which often enclose various substances more or less mixed with water. Sometimes the cell cavities are full of liquid water, forced up from the earth by the roots. But aside from this liquid water contained in the cells, the molecules of water help form the solid parts, as of the cell-walls. This last is perhaps difficult to comprehend, but it is exceedingly important that we should understand the fact in order to rationally acquaint ourselves with what takes place when a plant freezes. It has already been said that water is really made up of minute *solid* particles called molecules. The substance of the cell-walls, known as cellulose, is likewise composed of molecules, but of more complex structure and undoubtedly of considerably greater size than those of water. In the natural composition of the cell-wall the cellulose molecules may be represented by the bricks in masonry, and the water molecules by the grains of sand in mortar. Between these different kinds of molecules there is a strong attraction or adhesion which binds the whole into a solid substance. There is plenty of water present but no liquid. The water molecules are as truly a part of the structure as are the cellulose molecules. Ripe seeds have no liquid water in them, nothing but this water of structure, and comparatively little of that; so of the other parts of many plants in certain normal conditions of their

existence; while, on the other hand, more than nine-tenths of the weight of rapidly growing shoots is water in both the liquid and molecular states.

Let us remember that every solid is made up of invisibly small molecules, and that these are held together by the attraction that exists one for another; that the force or effect of this attraction varies inversely as the square of the distance. This distance, at most, is so minute that any variation makes considerable, perhaps very much, difference in the result. It is this molecular attraction that binds the cellulose molecules together with the water molecules into a cell wall. The molecules, however, do not actually touch each other. Each is wondrously endowed with motion and swings back and forth in a limited path of its own, not unlike, on an infinitesimal scale, the planetary bodies; kept asunder by motion, but held from farther separation by attractive force. In the living plant the swinging water molecules always separate from each other the cellulose molecules to a certain limited extent; but if by any abnormal cause the water molecules are once forced out and the cellulose molecules approach so near to each other that their own attractions are greater than that between the cellulose and the water, the latter can not get back; the organization is destroyed; the tissue fails in its physiological functions; the plant, or the injured portion of it, dies.

There is still another series of facts which, though more familiar, must be included for use in the explanations to follow. It is known to all that bodies shrink in size as the temperature decreases, and expand or swell with heat. The rails of the railway are perceptibly shorter in cold than in warm weather; the mercury in the thermometer sensitively obeys the heat changes upon the same principle. The tissues of trees form no exception to this rule. The variation in the circumference of an apple tree over four inches in diameter can be readily demonstrated by a common tape line. A box elder stick just cut, three and a half inches in diameter was found by myself to be a fourth of an inch greater in circumference between zero and plus 70° Fahr. In a large trunk the difference is much greater. It is also

well known that water from plus 39° Fahr. to plus 32° Fahr. is an exception to the general rule, and expands as the temperature decreases from the first named degree. In the act of freezing, further expansion takes place and in both cases with, what may be designated, resistless force. Iron pipes are split like fragile reeds; the thickness of their walls constitutes no safeguard; the iron itself shrinks, the water within expands, and bursting follows. If we should bore a hole in the heart of a tree and fill it with water, exactly the same result would follow upon a decrease of temperature below 32° Fahr. A tape line would indicate a constant decrease in the size of the trunk with the decrease of temperature until relief from the enormous pressure finally came by a longitudinal split. But such splitting does not take place in living trees, no matter how much water they naturally contain, until the temperature is far below 32° Fahr. The reasons for this have already been given and reference may now be made to our salt solution; but further discussion must first give place to still another peculiarity of the freezing process of aqueous combinations.

When plant tissues, in common with other things, containing water in a state of molecular association with other molecules, are subjected to certain low degrees of temperature, the outside or exterior water molecules first freeze or arrange themselves to form a crystal. The temperature at which this takes place depends upon the molecular attractions. When the amount of water is sufficient to fill the molecular interspaces to saturation, the crystal begins to form at very little below 32° Fahr.; but when the proportion is much smaller than suffices to equalize the attraction for the water molecules, the crystalline arrangement of the latter begins at the surface of the organic structure only, and at a much lower temperature. If a limb is cut from a living tree, hardy in our climate, when the temperature is at zero, and has not immediately preceding been much lower, neither the bark nor the wood will ordinarily be found frozen. A separated sliver is still flexible, and no ice crystals can be seen with the microscope; but a drop of water applied to the surface, even soon after the stick has been

taken into a warm room, instantly congeals as it does on similarly cold iron. Yet in this green stick there is forty per cent. of its weight water, existing there unfrozen at zero, Fahr., not as a liquid, but capable of being evaporated from the tissues at the temperature of boiling water.

When this water does freeze in some of our trees, at about  $-12^{\circ}$  to  $-20^{\circ}$  Fahr., a minute thin plate is first formed on the surface of the structure, or rather multitudes of such thin plates of regular shapes, are thus formed near together. With a little further decrease of temperature, other water molecules, are wrested from their attractions in the woody structure and arrange themselves beneath those first formed, and in so doing push the latter outward. This escape of some of the water from among the cellulose molecules causes the latter to approach nearer each other, and at the same time to hold with stronger power the remaining water molecules which only join their fellows in the crystal at a still lower temperature. As, however, the cold increases, the crystal pushes out, not gaining in diameter, but increasing in length by constant additions to its base, just as we may conceive of the erection of a chimney by successively placing bricks under those already laid and pushing upward the whole structure. The final length of crystal depends upon the amount of water and the degree of cold. Sometimes frozen succulent plants may be seen thickly coated with a crust of such crystals a fourth of an inch or more long, but so slender that a magnifier is needed to identify individual ones, the whole presenting to the naked eye a somewhat velvety appearance. Similar crusts are formed in the interior of the tissues on the surfaces of certain kinds of cells and pushing into cavities caused by the shrinking of the material.

We may now consider that we have the chief facts upon which the explanation of the two forms of injury to tree trunks by freezing rests. We have compared the splitting of the trunks to the familiar bursting—too familiar—of iron water-pipes and water pitchers. It is only necessary that a sufficient amount of water in the liquid state exists in the central parts of the tree, and that a sufficient degree

of cold can be reached, to shrink the woody fiber and congeal the fluid. If the water, though as a liquid in the ducts, cell-cavities and intercellular spaces, contains substances in solution like sugar, earthy salts, etc., freezing will be more or less below  $32^{\circ}$  Fahr.; and this is normally the case. If the water exists only in the imbibed state in the cell-walls, a much lower degree than this will be required to produce crystallization, and this is the normal winter state of a hardy and sound tree. It is only in spring-time, or in a spring condition of things, that any liquid water exists in such trees. On microscopic examination in winter no water as such can be found in the cell-cavities or other openings of the living tissues; yet by heat under  $212^{\circ}$  Fahr., forty per cent. by weight of water can be driven off. It is molecularly distributed among the elementary bodies of cellulose, protoplasm, starch, etc., all of which are much too minute to be seen with our best microscopes, but which as certainly exist as do worlds beyond the reach of telescopes, and both are as certain as human knowledge at its best.

I append a table of the proportions of water determined by evaporation in an oven kept below  $212^{\circ}$  Fahr., in the trunks of several trees cut in December, 1883. Where two numbers are given in a column the first shows the water in the inner portion, and the second in the succeeding ring of growth:

Trees.	Diam. In.	Per cent. of Water		Per cent. of Water
		Heart.		Sap.
Hewes' Virginia Crab, No. 1..	4	43.05		44.67
Hewes' Virginia Crab, No. 2..	4	42.29		42.75
Wilson's Sweet.....	6	44.30	46.00	42.30 48.80
Box Elder.....	4	41.92		40.85
Box Elder.....	5	41.18		41.86
Box Elder.....	3	33.48		38.18
Soft Maple.....	4	45.35		38.95

In the spring some of these trees would contain a greater per cent. of water, but I have no figures for amount. What has now been given may be a surprise to many, and the query would hardly be unnatural, "Why do not all the tree trunks burst when exposed to a freezing temperature?" If, however, the internal wood is sound—rotten wood soaks up great quantities of water—and the spring activities of the roots have not commenced, it is not likely that the trunks of any trees will burst by the swelling of ice formation. Whether or not the shrinking of the tissues by cold without concurrent freezing is with us ever sufficient to cause the longitudinal cracks we observe after the manner of shrinking by drying, I can not tell. Probably the bark may sometimes part through this cause. The tendency to such cracking by the change in size as the temperature decreases is just as certain as by the change through drying by heat. The only question is as to the amount of contraction by such cold as we have. Probably no trees ever burst until the thermometer marks zero or below, and then only when the heart is more or less rotten, or after the roots have started to absorb quantities of water from the soil, as in spring-time.

But this cracking open of the bark, or the latter and the wood, does comparatively little injury. It simply makes a bad wound without otherwise in the least destroying the vitality or healthfulness of the tree. I shall, therefore, only add an explanation of the crack so commonly occurring on the south side or that most exposed to the sun. If this splitting of the trunk can be properly compared to the bursting of a water pipe, how can it be that the points of the compass have anything to do with it? The rupture of an iron tube always occurs in the weakest place, and no amount of thawing and freezing on one side, with the other less subject to such changes, can make any difference in the result. Action and reaction are equal, pressure southward means equal pressure northward, and so of east and west. Now so far as the outer layer of bark is concerned the south side is the weakest, because of the drying effects of the sun; cracks always being more numerous here than elsewhere, and

this difference in strength, slight as it is, should be sufficient to cause the southern crack, if all other parts were exactly equal. There is, however, a far more effective cause for the phenomenon. Every change in the temperature of the tissues of a tree affects the quantity of water in the cells and intercellular spaces. Indeed it is largely by such alternating changes of heat and cold that liquid water gets into and accumulates in the trunk of a tree, mainly through the contraction and expansion of contained air. The corky bark is almost impervious to water and air, and forms a kind of sealed tube whose lower end only is open in winter. If air at first occupies all the cavities in the wood, as it does in summer, and a reduction of temperature occurs, this air very considerably contracts in volume, making a vacuum, or would do so were they not concurrently filled by the upward flow of air and water from the roots, and through them from the soil. When the air again expands pressure is produced, and, gases being more mobile than liquids, the air rather than the water is forced down or in any other direction, leaving another condensation by cold to act as before. In this way the tissues of the south side of an exposed trunk of apple or other trees gains more fluid than those of the north side. The increase of water and the consequent dilution of the dissolved substances causes earlier and greater congealing and its effects. I submit the following figures obtained by Mr. Hewes, a student of the Illinois Industrial University, in April, 1883, from experiments upon a soft maple (*Acer dasycarpum*) about forty feet high and nearly one foot in diameter of trunk:

No. of Observation.	Specific Grav.	Per cent. of Sugar.	Am't of Liquid.
10	N 1.013	3.3341	
	S 1.011	2.6485	
11	N 1.012	3.2279	
	S 1.008	2.0004	
12	N 1.011	2.9569	
	S 1.0088	2.2731	
13	N 1.006	4.4967	
	S 1.006	3.5150	



If the south side of the trunk is well shielded from the sun, splitting may occur, and then on any side; but the injury would not be so liable to happen. The condition of the heart of the tree must be an important item in the effect, but the last season's growth, whether vigorous or not, makes little difference.

Passing now to the much more serious injury — the separation of bark and wood — we may say that neither the swelling of the interior nor the shrinking of the exterior layers of tissues can be accredited with the disastrous results, for these crowd the parts together instead of forcing them asunder in a radial direction. Neither is it in any way the undue shrinking of the interior and extension of the outer portions, because no such thing occurs. The heart of a tree always freezes first. No change of temperature is sudden enough in the open air to cause the bark and younger wood to freeze before the pure water of the heart wood congeals, popular opinion to the contrary notwithstanding. The very heart of a healthy tree has more water in it, susceptible of freezing, than has the sapwood and bark, and, if vitality counts for anything, its influence retards the freezing of the outer rather than the inner parts of a tree. During the present winter an excellent opportunity has been offered for observations on this point. When the thermometer first reached zero in December, I examined the twigs of many kinds of trees without finding any of them stiffened with ice, except the very immature water sprouts of apple trees and the tall growths of the tender catalpa. The same was true at  $-6^{\circ}$ . At  $-12^{\circ}$  the pith of some last season's growths was hard and rigid, and ice was readily seen with a hand magnifier. This was observed in apparently fairly ripened twigs of pear — Bartlett and an unknown variety, — of some apple trees, of several raspberries, including Turner and Mammoth Cluster, of some shoots of Concord grape (not of those best ripened), of hybrid perpetual roses, etc. On the other hand, the wood and the bark of all these, except water shoots, were still flexible and without ice, while the twigs of most trees, as a whole, were unaffected by ice. At  $-28^{\circ}$  in a considerable number of in-

stances, the twigs and the separated wood snapped like icicles, and were found, more or less, crowded with ice crystals; yet, in a greater number of cases, the living parts were still flexible and tough. In very few species was the living mature bark, during the coldest period, found frozen — never in ripened apple limbs,—and these are accounted somewhat tender kinds, such as tulip poplar, the magnolias, various roses, peaches, raspberries, etc. The May cherry twigs have at no time during the winter been brittle by freezing.

It is, however, essentially certain that the bark of apple trees has been forced off by frost, the formation of ice in or near the cambium layer. It has not been my fortune to actually observe the phenomenon for the purpose of verifying the conclusions otherwise reached; it is difficult to find the affected trees or areas until long after the injury is done and the operating cause removed, and no artificial experiments have been tried. I venture, however, the assertion, that it is the growth of the forest of ice crystals from imbibed or molecular water heretofore described, together with the consequent shrinking of the tissues, that pushes off the bark, with or without a radial, longitudinal split. Such a crystalline growth does take place in the tissues of plants, and is readily seen by microscopical examinations of frozen succulent stems. The cause is amply sufficient for the result, and the only point upon which to hesitate is: Does this kind of ice formation really occur in the tissues between the bark and wood of the apple trees? We may positively say that, under the usual favorable condition of things in our climate, it does not. It can not readily be found this year after a temperature of  $-28^{\circ}$  Fahr. But, after all, may not the phenomenon occur under certain and peculiar circumstances or combinations of circumstances?

Having pretty well examined the problem, from what the courts call circumstantial evidence, I submit the following as the chief factors in the combination of causes leading to the unwelcome result: If, in mid-summer, a severe drouth occurs, the tree is checked in its growth so far that the stimulating influences of a warm, moist, spring-like autumn

start afresh the activity of the cambium cells, and if growth of new cells does or does not occur—usually it does—in the cambium of apple trees, though shoots start, the solution of the stored materials and undue absorption of water puts the tissue in condition to freeze in the manner mentioned, when exceptional cold follows in winter. The more severe the drouth the more likelihood of such an autumn spring-like start. Florists know very well that to cause a plant to grow out of its season, nothing so prepares is as a preceding rest, brought about by withholding water. Without such rest the same stimulating influences will not operate. In its normal season maturation may result instead of new growth, under the attempts to secure the latter. There can be no doubt but that apple trees are more or less checked, in many situations, by the want of water during the dry times of July and August, and more in some soils and situations than others. Neither can there be any doubt of a responsive activity to the effects of a warm and wet autumn. The buds swell and burst into shoots or flowers in many cases, and in the southern latitudes of Illinois are sometimes very conspicuously developed. With a corresponding activity of the cambium and a subsequent hard freeze, it is little wonder that damage is done.

The evil consequence then, of the summer's drouth, is what we should in the first place strive to avoid. This may be accomplished in several ways known to us all, and I may only mention such as the choice of site, deep drainage to favor the penetration of roots into soil likely to be moist in summer, good surface cultivation during dry times, extensive mulching, and the selection of varieties possessing powers of withstanding drouth. Of these only the first will be further discussed.

In my own region of country, Central Illinois, I have been greatly struck with the comparative healthfulness of apple orchards on the flat lands, while upon the high ridges, usually most esteemed for fruit trees, decided unhealthfulness is the rule. In view of the foregoing, is it not probable that an improper choice of location has very often been made for the orchard? It can not be said that the highest

lands are always most susceptible to drouth, but this is generally true in the region mentioned. The soil of the lower grounds is richer, at least in partially decomposed vegetable matter, and this aids greatly the retention of moisture. For other reasons one would not choose for an orchard site a place relatively very low; but there is much difference between flat land and low land. Certainly no one would select a slough as the most suitable for orchard fruit. Too much water at other times of the year is as bad as too little in summer. Land that is, however, too wet, may be so improved by tile draining that it may become the very best for apple trees, being rich and light, with no standing water, but moist enough at all times for the healthful development of orchard trees.

The apple crop, in 1883, in Champaign and adjoining counties, was very good, thousands of bushels of fine fruit being gathered; but the difference in orchards differing only in the nature of the site, and as far as could be made out, in the relations concerning water, was very remarkable. Nearly all the apples worth anything came from land having very little slope and which, though not usually drained, would be much benefited thereby. A few orchards on the higher ridges were abundantly productive, doubtless due to the peculiarities of soil and subsoil, while by far a greater number so situated produced nothing fit for market. The attention of those who contemplate planting trees has been forcibly drawn to the subject and the old ideas concerning selection of site have been thoroughly overhauled. Doubtless mistakes will yet be made, and possibly now on the opposite side from those of previous years. We shall do well to remember that it is the excessive dryness of the soil in summer that is to be avoided, not necessarily the highest grounds.—Professor Burrill, in *Trans. Miss. Vall. Hort. Soc.*

## HOW I DID IT.

My experience in horticulture is not very extensive; and may not be interesting, and my conclusions may be ridiculed by scientific men. But as long as I am successful, just so long I shall be fool enough to keep on blundering in the course I have begun. It makes no difference whether an apple is raised scientifically, or naturally; the fruit is what we are after. If that is satisfactory, and the supply is likely to hold out, that is all we hanker after.

Wise men err, some of us know that by experience, and fools sometimes blunder in the right direction. It is often hard to know which are the fools, and which are the other class. The wisdom of to-day may be folly long before the next generation get through cutting teeth. We laugh at many of the theories of our ancestors, and our children will make fun of their fathers'. This is emphatically so in matters relating to horticulture. The failures of the last twenty-five years have taught us the folly of scientific theories, and made us rely more on our own experience. No matter if we cannot tell why a thing is a success, it is the how that we are after. What is a success with me may not do for my neighbor with a different soil and location, hence the necessity of exercising a little common sense in the matter.

That was what ailed the pioneer fruit raisers (?) of Wisconsin. We tried to raise the same varieties of apples grown successfully upon the old homesteads in the far east. Our choice of location, manner of setting out, and after-culture were the same. And how we wondered at our repeated failures! The books told us we were right; that it was not we that were blundering. We came to the conclusion that it was all in the confounded climate, and we were a set of fools to waste our time and money any further. Apples never could be raised in Wisconsin, unless it was the toughest kind of crabs. Many a disappointed horticulturist got permanently disgusted, and, to this day, puts his faith only in Siberians.

It took years of patience, it took experience, it took common sense to make our people believe that Wisconsin is yet

to be — is now — one of the best fruit growing states in the great northwest.

In apples, some of our Badger seedlings will lose nothing by comparison with any, and our grapes can not be beaten in flavor, size and productiveness.

Some croakers tell us that we are yet doomed to disappointment; that some of these hard winters will freeze the vitality all out of our cherished trees, and leave us nothing but blasted hopes. It may be so; but no matter, we will enjoy the fun while it lasts.

My first attempt at an orchard in Wisconsin was over twenty years ago, and proved a "fizzle." But I learned that the R. I. Greening, Baldwin, and such eastern favorites had better be let alone. I next tried native seedlings, thinking, of course, that they must be hardy. But about the time they got to bearing, they left me, and their memory is anything but pleasant. I then got discouraged, and gave up horticulture as a bad job, and tried to adapt my taste to our seedling crabs. Then I wanted to move, O, so bad! If I could only sell out, how quick I would go where apples and cider were cheap, and grapes plenty. But I could not sell, and was obliged to stay; and now I don't want to leave, for I have learned that we can raise cheap apples and cheaper grapes, even in this latitude.

A few years ago I bought of friend Springer a lot of root grafts, and put out a small nursery, just for my own convenience. The most of them proved to be kinds not popular now, but they made me some splendid stocks to graft better kinds upon. My way is this: In the spring I saw off what I want to use, just above the crown, and graft into the stumps; the next spring I take them up, and set in the orchard.

My land slopes gently towards the east and southeast, well protected on all sides, a clayey loam with a red clay subsoil. In starting, I plowed as deep as convenient, then cross-plowed, turning the back furrows just sixteen feet apart (I think twenty feet would be better) — the distance between the rows of my trees. I placed my trees along the back furrows, digging only as deep as I had plowed. When I got a hole

dug I went to the nursery, took up a tree and *at once* set it, being careful to get it in the same position that it occupied in the nursery in regard to the points of compass. If the hole was not deep enough I hilled it up, so as to have it, when the dirt got settled, no deeper than its original bed. The top being small, required no trimming, and my trees had nothing to do but go ahead, and they have kept doing so ever since. They are just coming into bearing, and I challenge the county to show thriftier young trees than mine. I believe in low tops, and have trained mine accordingly. In setting I find great advantage in giving the trees a little southwesterly slope; they will come up straight enough, and many will be a little too straight. Every fall just before winter, I bank up my trees with dirt, to be taken away in the spring. It serves as a protection from the mice and also from injury through freezing and thawing.

I have cultivated the land, so far, but mean the coming season to seed to clover; as the tops of my trees are getting too large to work among them safely with a team. I shall take one crop of hay off early, and let the second crop go back to seed and enrich the land, and give the ground a mulching.—J. Wakefield, in *Western Farmer*.

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### NOTES ON APPLES.

Mr. G. F. Lewis, of Omro, Wis., writes, that in his locality the varieties that succeed best are Duchess, Ben Davis, Walbridge, Pewaukee, Golden Russet, Willow Twig, Utter, Tallman Sweet and Red Astrachan; on clay soil, well under-drained, facing the east and south.

Mr. O. B. Barber, a lawyer and practical farmer, of Tomah, Wis., reports for a number of towns in his county, saying that most of the hardy standard varieties do well in that portion of our state on a northern slope, with clay resting on a gravel subsoil.

C. E. Fry, of Bloomfield, Iowa, says that most of our standard varieties succeed well on northern slopes with good clay soil.

Mr. N. Johnson, of Mount Pleasant, Iowa, writes: "I have 800 bearing trees, of 100 varieties, which is seventy-five too many. Among those which succeed best are Ben Davis, Wealthy, Fameuse, Grimes' Golden, Maiden Blush, White Winter Pippin and Willow Twig; on northeast or southwest slope, with good clay soil, well under-drained. I would advise to plant only iron clad trees; trim sparingly, and protect on the south and west with belt of timber."

Mr. J. E. Adams, of Paris, Edgar county, Ill., says that in his locality they have the best success with Early Red June, Early White Wine Sap, Yellow Harvest, Red Astrachan and Romanite; prefers limestone land, but Red Astrachan prefers black prairie soil. In my own orchard, on rich clay soil sloping to the north, I find Ben Davis, Tallman Sweet, Bell Flower, Golden Russet, Jonathan, Fameuse, Plumb's Cider, Walbridge and Red Astrachan, all to succeed well.

Now, these are localities widely extended, but in varieties quite a unanimity of expression as to hardiness and location of the orchard, with soil best for good results. In many localities the blight or scab is quite a drawback to perfect fruit. The inducing cause of this, and a remedy, is a study for the naturalist and scientist, and he who shall find a sure and easy remedy will confer a favor on all fruit-growers. Now, if anyone asks what we shall plant, my answer will be to plant of the varieties that succeed best in your locality, soil and exposure being equal. But this is not all, for if you will raise apples for the market they must be of such varieties as will sell well and keep well; and so of summer and fall apples; unless you are sure of a near market, plant sparingly. And then again, some of the hardy winter varieties, like the Walbridge, are small and of poor color, and though a better apple than the Ben Davis, yet of this variety you could sell ten barrels as easy as one of the Walbridge, because it is larger and more showy. The Jonathan I consider one of our best winter apples; in color a perfect beauty, and quality superior to anything that grows in Wisconsin, and though not considered extra hardy, I find my own trees do as well as any on my grounds. It is another mistake to suppose that you want a hundred varieties, when



a dozen or so of the best for your locality, either for market or home varieties, would be preferable. I cannot close this already too long article without saying that eternal vigilance is the price of a good orchard. So do not buy good trees and then think they will take care of themselves after you have planted them out.—B. S. Hoxie, in *Western Farmer*, 1882.

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### FRUIT PROSPECTS.

On the fourteenth day of May I issued a circular letter to the members of the state society, and to others in the Northwest who are interested in fruit growing, making inquiries relating to the condition of fruit trees and small fruits.

And from a very general response I am able to give a condensed report. Section three of the act of reorganization says: "It shall be the duty of said society to aid in the formation and maintenance of county and local horticultural societies; to promote the horticultural interests of the state, by the holding of meetings for discussion, by the collection and dissemination of valuable information in regard to the cultivation of fruits, flowers and trees adapted to our soil and climate, and in every proper way to advance the fruit and tree growing interests of the state."

The severity of the past winter has made me solicitous to know more of our iron clad varieties, if, indeed, we have any that can lay claim to that title. The list of eight varieties best adapted to Wisconsin; hardiness, productiveness and quality taken into consideration, are Duchess, Wealthy, Fameuse, Pewaukee, Plumb's Cider Walbridge, Tallman Sweet and Wolf River. Most of the reports say that the above list is all right, and all speak of the Duchess and Wealthy as being iron clad. There are orchards and isolated trees of the Duchess, which were planted out more than thirty years ago which are now vigorous and healthy.

In response to my letter to Mr. Webb of your paper, he replied that "This variety so far appears to be a complete success in this section." And let me say right here this is

not a crab variety as many suppose. The Wealthy, though a later variety, promises to be everywhere in the Northwest just as hardy. This variety, as many of your readers know, is a native of Minnesota, and originated with Peter M. Gideon, from seed sent to him from Bangor, Me., some twenty years ago; and it was very fitting in him for such a beautiful fruit, to give it the name of his wife, Wealthy.

The Wolf River, though not so widely disseminated, will be generally sought after for its size and beauty and perfect hardiness in many localities. It was this variety which gained such notoriety in the New Orleans exhibit. In southern and southwestern Wisconsin some other varieties than these mentioned succeed well, and came out all right this spring, as for instance Roman Stem, Golden Russet, Fall Orange, Willow Twig and Red Astrachan. The most of all these varieties promise a good crop this year.

Of small fruits the reports are not so favorable. Blackberries of all varieties, not protected, were generally killed down to the snow line. Raspberries, not quite so bad. Strawberries, whether protected or not, are in good condition; the covering of snow was quite sufficient. Grapes that were protected are looking well, those not protected are badly damaged. J. M. Smith, of Green Bay, writes that he lays down and gives a light mulch of dirt and marsh hay to all small fruits, and this spring everything is looking fine.

It will be noticed that we have a lot of good varieties of apples that can be depended upon in our varying soil and climate, while other choice varieties succeed well in many localities. We have other new varieties of seedlings and late importations from Russia, that give promise that they can be classed among the iron clads.

These facts should be borne in mind in setting out new orchards, either for home use or for market. All of the new varieties of crab apples succeed well in all places in the Northwest; and at some points near Milwaukee and Green Bay, the more hardy varieties of pears are looking well and promise a fair crop, but it is not safe to put much dependence on this fickle fruit in our climate. Another fact must be learned; that to succeed with that most delicious

fruit, the blackberry, the canes must have some winter protection, and no market gardener can afford to lose a crop by this neglect. The lessons of the past winter are well, if they be heeded by the fruit grower, whether he be growing for his own use or for the market.

To one and all my thanks are due for their timely reports.  
—B. S. HOXIE, Cor. Sec. Wis. Hort. Society, in *Northwestern Farmer*.

Evansville, Wis., June 2, 1885.

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### RUSSIAN APPLES.

I am able to make only a partial report on Russian apples, although I have been at work and investigating the subject for some fifteen years-past. We have some Russian varieties that we think are all right. I exhibited at our state fair this last fall sixty varieties of Russian apples and we made a very good show so far as that is concerned; many of them were large and showy apples. I have the Longfield and I have been of the opinion that the fruits brought from that portion of Russia, off northeast of Moscow, would be perfectly adapted to the prairie regions of the Northwest; and from my experience with these fruits I have not yet lost faith that that will be the case.

I have not seen anything, among over a hundred varieties that I have in orchard — I have not seen anything so far as the wintering is concerned, that is hardier than the Wealthy so far as the tests I have made go. And I consider the Wealthy as hardy as anything that has originated in our state.

The country from which these Russian varieties come is very similar to this; it is a great prairie country a thousand miles in extent — a rich prairie country many portions of it. There are orchards there situated in what we would consider very unfavorable localities, on deep, black soil; but they are successful, and in those orchards they have been growing fruit for hundreds of years. I thought myself, at the start, that we never should be able to find anything

among the Russian apples that would keep, from the fact that the trees there were grown so much further north than here, and it is a so much colder country that the apples that were there winter apples would become fall apples here. But we have fruited some that were good keepers, some that will keep nearly to the time of the season of new apples, so that idea has been dissipated. We are going to have a fair number of late-keeping Russian apples. For summer we have an early apple and a better apple than anything else that I have ever grown for an early apple; that is, considering the quality and its appearance for the market; I do not think we have an apple that is equal to it, as an early apple. It is longer in season than any early apple I have ever known. My apples get ripe about the 25th of July. I had some at our state fair that had been lying on a shelf in an upper room until the time of the fair and that were in good condition. This apple, so far as quality is concerned, is about like the Early Harvest; I think it is a better apple. The tree seems to be perfectly hardy and is a very early bearer; have had the tree bear when only three years old from the graft; it is a very desirable tree for early fruit. Then we have another hardy apple that is better in quality—in fact we have nothing better so far as quality is concerned except the Early June. It would not be a good market apple because it scabs somewhat, but it is of very fine quality; the tree is very hardy.

There seems to be a peculiarity that these trees come in sorts of classes. There is the Alexander class. There are several apples of that class, all subject to blight, every one; the Tetofsky, and six or seven of that class of apples have the same peculiarity. There are others more showy than the Alexander, some of them that are striped and quite large; these apples are subject quite as much to blight as the Alexander; but as the trees get older they do not show the blight so much. Then we have a class of apples of the Anis family, and there are several varieties. How valuable they are going to be I am not prepared to give an opinion. The tree is said to be perfectly hardy, said to be the most hardy of the Russian fruits. There is quite a

difference in the varieties belonging to the Anis family, as regards the quality of the fruit. We have one known as the Anisette, which is almost if not quite the Duchess; it is very similar to the Duchess; the tree looks very much like a Duchess. We have also the Red Anis and Yellow Anis; I cannot see any difference between the red and yellow. These are among the five varieties found by Mr. Budd in Russia.

We have another apple that we have tested enough so that we are willing to put confidence in it, and that is the Longfield. I don't know of any of the Russian varieties that is perhaps more valuable to plant. I have fruited it for five years in succession and raised a crop every year. I have the apple here. It is an apple of good quality, and I think fully as good as the Fameuse; and I think it is a better keeper; my apples have not rotted as much as the Fameuse. Dr. Regel says of the tree that in an orchard of over a hundred varieties it is the only apple that would bear every year. With me it has fruited, as I say, every year for five years, each year increasing its crop; and I had trees this year the most heavily laden with fruit that I have ever seen. Here is a specimen of the Longfield. Here is an apple that is a great keeper. That tree is a great bearer, and I think the fruit will keep till June.

I have another apple that came to me under the name of Lord apple that is much like this one in appearance and is a little more acid, rather sharp acid, fine grained, and a very good keeper. I think it is going to be a valuable tree for a late keeping apple. It is a good bearer. I neglected to gather the fruit on that tree until the last of October. I was told by a neighbor that he saw a person carrying fruit from my orchard, and had seen him making two or three trips. I examined and found no fruit left except a few specimens I found in the grass; these are the ones. That is a late keeper, probably as late as any I have.

I would say that these apples were on exhibition at the county and state fairs. I put them in a box and they were there until two weeks ago when I went and picked them out.

I have no question in my own mind, from what I can see

and from my experiments with these Russian fruits, that they are going to be adapted to this whole prairie region, clear up to Manitoba. Trees have been doing well with me the past five years. Some of my trees set three years ago have been fruiting some, and have come through these hard winters in perfect condition. I can see no reason why these apples, coming from a country much further north than ours, and with conditions very much like ours, should not be adapted to the climate here. There are no orchards on this continent that will compare in extent with the orchards which are to be found in Russia. The whole business of a considerable portion of this country seems to be the growing of fruit in an open prairie country, and it is a business that is successful. The Volga answers to the Mississippi and the Missouri here; it drains a great prairie country, a rich prairie country, and these apples grown on the Upper Volga are transported to Palestine and Southern Russia, and there they find their market. The people living in Palestine get their apples from Russia. Mr. Gibb tells me that they told him there that in their mildest winters the thermometer ranged lower than it does here this winter, and that without a particle of snow on the ground the trees were preserved.

It will take some time yet to try and determine the value of these Russian apples. I have some fifty varieties that I have not fruited yet; I fruited some sixty last season and we expect to find something among them that will be of value; have already found something that I know will be of value to this whole northwestern country.

I have not come here to represent a nursery; I come here as a fruit grower. My business has been fruit-growing for more than thirty years; I try to throw aside my nursery business whenever I go into a convention to talk fruit. My orders for these trees are fifty times what I am able to supply; I don't take one order in fifty. I am not here to recommend any fruit for the purpose of sale. I have already had too much notoriety on this Russian apple business through your reports and that of Iowa, and the report of Mr. Gibb, of Canada.

Col. Stevens.— Have you raised the Russian Transparent?

Mr. Tuttle.— Yes, sir; it is the early apple I was speaking of. I think there is some variation in this class of apples. Take the White Transparent and the Yellow Transparent, I can see no difference in the fruit. Whatever else we may find for an early apple among the Russians, I do not expect to find anything better than that. It will be the early apple not only in the Arctic regions but here as well.

Mr. Smith—I would like to inquire about No. 190, known as the Tiesenhausen.

Mr. Tuttle— It is a late keeper; it is of good quality and in form like the Ben Davis. Prof. Budd, when he returned from Europe, gave out the idea that the apples that I had were not the true Russian apples, but were German and coast apples. Well, I happened to have pretty much all the kinds he mentioned and among the varieties I have are the five varieties of the Anis. I have taken pains to get the best, and Mr. Gibb, of Quebec, says, after looking over my orchard and examining my Russian apples in my orchard, that I have nearly every variety of value. At that time he held out the idea that my apples were not adapted to Minnesota; but I guess, perhaps, he has now given that up. I have had a little controversy with him. The fact of the matter is that Dr. Reed, in collecting those fruits for the United States, did very thorough work, and he selected apples which were grown throughout the whole of Russia.

Mr. Sias—I would inquire if you have fruited the Red Black?

Mr. Tuttle— No, sir; I have not.

Mr. Sias—I have a specimen here I would like to show you.

Mr. Tuttle—I would like to say a word about the Repka, on account of its late keeping, a variety which Messrs. Ellwanger and Barry highly recommend. With me it is a late keeper and seems to be of very great value. My trees stand on June-grass sod and have stood there for five or six years, but have borne every year; the past year they bore a very heavy crop.

I wish to say here that I would rather be the originator of

the Wealthy apple than to hold the highest office in this state. It has done more for the Wisconsin Horticultural Society than anything that has ever been done.

Mr. Smith—Is it not your opinion that these seedlings show better characteristics as to shipping and keeping qualities than the average of the Russians?

Mr. Tuttle—I do not think that a promiscuous lot of seedlings would show equal keeping qualities. We have very few Russian varieties that are not better keepers than the Duchess. According to one authority the Longfield will keep as well as the Snow apple, and we call the Snow apple, pretty good.

Now, I am not advertising these apples myself; in fact many of these new kinds I haven't got in the nursery at all, that is, I have none for sale. Until Mr. Gibb came to my place there were several kinds I didn't know anything about. There are men who are traveling through the country selling Russian apples and it is a credit to their business, but there are lots of things that are sold that are not Russian. The Pewaukee is sometimes sold as a Russian apple, and the Waldron. They come here and sell them, but I have not seen any of these men traveling and selling Russian apples that were selling a list of strictly Russian apples. They send out the Lord apple when it is nothing more than the Alexander.

Mr. Sias—I have fruited about fifty varieties of these new Russians and I fully agree with Mr. Tuttle on that point raised by Mr. Smith, as to whether they average as well as the seedlings. I think the Russian varieties average much better; that is, as to quality and hardiness as compared with the seedlings. Now, I am on the seedling committee and don't wish to say anything out of the way in regard to the seedlings, for I believe in the seedlings, but facts are what we are to get at. The Russians are hardy and they average much better than a lot of seedlings such as are generally to be found through the country.

Mr. Tuttle—Mr. Dodge says he did not find the true Duchess in Russia. The Red Anisette, the Yellow and the



Green Russian are so near alike that one has difficulty to distinguish between them; and yet I can see a little difference. They are Duchess in tree and Duchess in fruit. — A. G. Tuttle, in *Report Minnesota Horticultural Society*.

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## THE FUTURE OF ORCHARDING IN THE PRAIRIE STATES.

The apple, pear, cherry, and most of our plums, are not native to our continent, and their introduction into the states west of the great American lakes has not been guided by the scientific skill in selection which characterizes such work in the colonies of all the civilized governments of Europe.

Without exception, the scientific observers connected with the early surveys of the illimitable prairies of the west, interpreted the absence of the Conifers, the Rhododendrons, the Mosses and all the characteristic trees and plants of the more equable regions nearer the coast and lakes, to mean an inter-continental climate of extreme changes in temperature and humidity.

In these early days of prairie settlement, such men as Judge Knapp, Dr. John A. Kennicott, Robert Russell and J. G. Cooper, unitedly expressed the opinion that the world had no counterpart of our plains in soil and climate, except the great plain which covers, like a blanket, fully three fourths of Europe on the northeast.

These men, in connection with Arthur Bryant, Hon. G. P. Marsh and many others, also predicted, in those early days, that unless systematic timber planting was commenced and carried forward to offset the destruction of the dense growth of prairie grass, and the effects of opening the clogged drainage centers of the primitive prairies, consequent upon occupation and cultivation, the already fickle and extreme climate would change for the worse as the years went on.

With such clearly expressed views as to the nature of our climate, it would seem passing strange to the people of

Europe, so long accustomed to well-equipped and endowed experimental stations, that we have never attempted to row our own horticultural boat, but have permitted the nurseries of the eastern states to do our importing of trees and shrubs from the mildest portions of southern Europe, mainly indeed, from the nurseries of Thomas Rivers, in England, and André Leroy, in southern France. Our plan really has been to try everything which our eastern friends had to offer, and hold fast to that which was good. Unfortunately for our interests, southern Europe has very few varieties of the fruits which will long survive in our climate, and the very few we have received are really strays from the east plain of Europe, or seedlings grown on our own soil. As instances of real iron-clads over broad expanses of our prairies, all will think of the Duchess, Gros Pomier, Fameuse, Drap d'Or and Wealthy — all but one strays from the east plains, and that one, beyond doubt, a seedling of Duchess or Tetofsky.

Of pears, we have not one true iron-clad, and the nearest we have — the Besi de la Motte and Flemish Beauty — are from Poland, on the borders of the east plain, but modified by the breath of the gulf stream.

With the cherries we are quite as unfortunate. The Dukes and Bigarreaus of the east utterly fail with us, and the early and late Kentish and English Morello, in addition to short life of tree and irregularity of bearing, are far lower in quality than any one of the Griottes grown by the train loads on the plains north of the Carpathians. As to plums — without thanks to our eastern friends or to south Europe, we have been more fortunate, as nature has provided us with better native varieties than I know to exist elsewhere.

Beyond doubt we have lost millions of dollars and an untold amount of time and faith, in unsystematic trial of fruits adapted to more equable climes. Surely the time has come when we should unitedly give trial to fruits of like climates, so far as they are commercially obtainable. Perhaps ultimately our favorite fruits will be seedlings of those we first introduce, but the only safe line of experimentation is based on the assumption that the future favorites of our

orchards of the apple, pear and cherry, will come from climates fully as severe as ours, or will be seedlings of such varieties grown on our own soil.

With the hope of aiding in this systematic experiment work so much needed, I will offer a few suggestions based on a careful study of the climate, soil and fruits of intercontinental Europe in the summer of 1882. These hints are formulated on the well-known fact that every part of the Mississippi basin is subject to extreme summer and winter variations of temperature and humidity of air, consequent upon the varying winds, and that mere ability to endure a very low temperature, is the only requisite needed at the north which in the south part of the basin may be dispensed with.

Southern Illinois, Missouri and Kansas may safely experiment with apples, pears, cherries, plums, apricots, nuts, ornamental trees, and shrubs of the plains of northeastern Austria for the western portion, and of Transylvania for the eastern portion. Here are found late keeping varieties of the apple, comparing favorably in size, beauty and quality with the best we know, growing on trees with foliage as perfectly adapted to a varying air as our Duchess. Here also are found many varieties of the pear with the perfect foliage of the Chinese Sand Pear, yet producing fruit nearly equal to the best sorts of France and Belgium. We have the less reason to believe they will be subject to blight to a serious extent, as for ages they have been subject to intercontinental extremes like those of our valley.

In this region will, in like manner, be found the coming cherries for the dry belt where the extreme winter temperature does not reach lower than from fifteen to twenty degrees below zero.

The plains of Galicia are checkered with lines of cherry trees along the sides of all highways, and marking the division lines of estates, to an extent not found in many parts of Europe. The varieties too, are all new to an American. A careful study of their leaf structure, fruit, habits of growth, etc., will convince the most skeptical that we have gone sadly astray in selecting fruits for an interior prairie cli-

mate. The Griottes, with small pendulous branches, and fruit with colored juice, are generally used for roadside planting, as the trees do little shading on account of their small size, and the fruit can be used for dessert, culinary purposes, and for the favorite drink of high and low, known as "Kirschwasser." In every respect the fruit is far superior to our Kentish cherry, or any one of the Morello type we know. In the fruit orchards, and on the grounds of land proprietors, we find many varieties of a race of sweet cherries not known to us. With the round spreading top of the Morellos they have the excellent fruit of the tall growing Heart varieties, and a leaf that can defy our summer changes. Some of the amarels of this region seem a cross of this sweet cherry with the form of Morello, of which our Leib is a type.

The apricots of Galicia and Transylvania, and their form of English walnut (*Juglans regia*), are equally worthy of trial in the Missouri belt, together with their filbert, currants, gooseberries, and even grapes. Though we have failed with the French grapes, the northeastern varieties are well worthy of trial, as their foliage will stand our air quite as well as our native *V. labrusca*. We saw on the Volga many tons of dried grapes from northern Persia and Bokhara, which were infinitely superior to our home sorts. Where they will endure the winters they are eminently worthy of trial.

In this region no hardier peach is found than those we have. The coming peach for the Missouri belt is from northwestern China. While equal in fruit to our best sorts, it is able to endure greater extremes of temperature.

The belt across the Mississippi Valley corresponding to southern Iowa may experiment with the same races of fruits, and from a portion of the same great plain, but farther to the east.

The provinces of south Russia, east of Poland to Kiev, are well supplied with choice fruits, and the soil and climate are as nearly identical with ours as they well could be. Many varieties of the Galicia belt will not be found, but their places are taken by others but slightly, if at all, lower in the scale of value. The most positive change is with the

pear. Many of the best dessert varieties here become tender, unproductive and short-lived, and their places are taken by slightly coarser varieties of the Bergamot and Gucha type. The best of the Griotte cherries are still found, and many varieties of the Glaskirke, and a form of the Geans much like our Dukes, but with different leaf and a lower spreading top. The *Juglans regia* is still productive, but is sometimes injured by the test winters.

For the belt across the valley corresponding to central and northern Iowa, the fruits of the black soil prairies of the great provinces of Orel, Koursk, Varonesh and [Saratov, in central Russia, will best meet the requirements of soil and climate. Apples, pears, cherries and plums are yet found of such size, appearance and quality as would surprise any member of this organization suddenly set down in the midst of one of their great commercial orchards. The visitor will rarely find a variety of any of these fruits which he found six hundred miles eastward. The very few exceptions, such as Autonovka and Longfield apples, and Bessemianka and Red Bergamot pears, we are told at once are strays from central Russia, thriving equally well in a less extreme climate, as does our Duchess apple. Excellent forms of the Griotte cherries are still found, and many varieties of the low-growing sweet cherries and amarels are grown with greater or less satisfaction, depending upon soils and mode of growing. The apricot and mulberry are yet grown in considerable quantity, but the varieties are lower in quality for dessert use than farther west.

The belt corresponding with Minnesota up to the forty-fifth parallel, including southern Dakota and northern Wisconsin, will reach the highest attainable success with the fruits of Simbrisk, Penza, Riazan and Tula, on the north line of the black-soil section of central Russia. The visitors to these little known provinces, reaching up to the 55th parallel of north latitude, will be surprised to find so many varieties of excellent apples for all seasons, and so many variations of the indigenous Bergamot and Gucha pear, most of which are excellent for culinary use, and a few are from fair to good for eating.

The only forms of the cherry grown in quantity are of the Griotte race, and the trees are grown in commercial orchards, in bush form, with several stems, and pruned on the renewal system of taking out the old wood. In size, flavor, and amount of grape sugar, they far excel any one of the Kentish type found in south Europe.

To those who conclude that the apples of this high latitude in Europe will materially change their season of maturity when grown in the Minnesota belt ten degrees farther south, it will be well to suggest that the prevailing summer winds of this part of Russia are from the southeast, coming up from Persia, Arabia and the heated steppes of southeastern Russia. Hence the average summer temperature is really higher than that of the Minnesota belt across our valley, while the winters are much colder and with less average snowfall.

In the extreme upper portion of our valley, in northern Dakota and Minnesota, even in the great valley with a northern trend at Lake Winnipeg, the possibility of successfully growing the apple, pear and cherry exists. The ancient provinces of Kazan, Nishni-Novgorod and Vladimir—even north and far to the east of Moscow, on the 57th parallel of north latitude—grow apples for all seasons, of excellent quality, in a commercial way. In this coldest orchard region of the world the little trees seem as hardy as the Siberian crabs, yet the fruit sells well in Moscow in competition with that from the south.

The far northern pears of this section are quite hardy in tree, but the fruit is too low in quality for consumption in the large cities. Yet it is grown in great quantity for culinary use among the peasants and for exporting to Perm, on the northeast verge of the plain. As an ornamental tree this far northern form of the Bergamot has much merit, and it gives us a hint of possibilities in the way of originating, by crossing, pears of excellent quality for the extreme northwest.

The cherries of this region have had a historic record for centuries. In Vladimir, one hundred and fifty miles east and north of Moscow, they are grown in quantity too sur-

prising for popular belief in our valley. Though somewhat smaller than the best Griottes of the south parts of the plain, some of the Vladimir varieties are nearly sweet and of decidedly good quality for any use. That they can be grown as far north as Lake Winnipeg, in Manitoba, we do not for a moment doubt.

Plums, approaching our Damson in quality, and much resembling it in size, form and color, are grown in quantity in this far northern section of the steppes. That they will prove an acquisition in the extreme northwest is beyond doubt, if the curculio will respect them to the extent of giving us an occasional crop.

These hasty suggestions as to the adaptation of the fruits of special portions of the greatest steppe section of the world to special belts across the prairie states of the west, must of course be of a general character. In practice they would be modified by the varying soil and climate of the east and west portions of each belt, and the belts would overlap with special changes of soil, elevation, exposure, etc.

The only purpose is to outline some profitable lines of work for the experimental stations, now in process of organization and development in all the states of the valley. We have learned that the process of acclimation is a tediously slow one with our trees, and I believe our people are about ready to encourage the policy universally accepted by the European governments in the management of their colonies, viz.: The introduction of cereals, grasses, fruits, shrubs, etc., from like climates and soils, if they can be found on the earth's surface.

With the limited pecuniary means at command, we are doing what we can in the line indicated on the grounds of the Iowa Agricultural College at Ames. We have now growing, specimen plants of the apple, pear, cherry, plum, apricot, peach, junberry, walnut, ornamental trees, shrubs, etc., from every part of the great east plain of Europe I have named. Their summer and winter behaviour for the past two years in our climate has been exactly in accordance with what we might expect from their relative position in their natal home. To briefly illustrate: The leaf of the

Richmond cherry has been defective with us for two years, and last winter the trees were killed to the snow-line. On the other hand the Griottes and Russian Glaskirke varieties have maintained perfect foliage and have been unharmed by the test winter. In like manner the Flemish Beauty pear has not had, during the past two summers, a single leaf free from the brown fungus on the under surface, and last winter the trees were either wholly killed or so lowered in vitality as to be really worthless. The Besi de la Motte, from the edge of the great eastern steppe, has maintained healthy foliage, but its wood was slightly colored by the test winter, yet it has made rapid and healthy growth the past summer.

The Besseminanka, Tonkavetka and other pears from central Russia have maintained perfect foliage, except for slight injury by the pear leaf mite, and the terminal points of the shoots were as clear and bright last spring as the wood of Russian poplars.

Our apples of the grade of hardiness of Ben Davis, Jonathan and Dominie were defective in leaf the past two years, and last winter were irreparably ruined. On the other hand, our old varieties from the east plain, or their descendants and over two hundred varieties recently imported, started from the terminal points where grown upon rich garden soil.

Yet our collection is too varied for any one experimental station of the west, as it embraces varieties which will do best in the Missouri belt, and varieties which should do best in the belt of north Dakota and Minnesota. If the experimental work could be distributed and each of the belts across the valley I have tried to indicate could experiment with the products of its corresponding section of the east plain, the work could not fail to result in advancing our horticultural interests. So far, in talking of Russian fruits, we have not taken into account the enormous extent of the empire. We do not want the fruits of St. Petersburg or any part of the coast section within three hundred miles of the Baltic. That we do want the fruits of the provinces named in this connection I am equally certain, if properly distributed



over our great valley. We must never forget that we must have in our valley, from the Missouri belt northward, varieties of all the fruits that will maintain perfect health of foliage, or we can not expect paying crops of perfect fruit. A tree may endure our winters passably well, yet on account of leaf trouble during our dry, hot summers, it fails to develop the cell structure of the wood in the perfect way needed for holding and perfecting the fruit crops. With the advent of varieties as perfect in leaf as the Duchess apple, the Besseminka pear, and the Vladimir cherry, we may expect a show of blossoms to be followed by perfect fruit.

The crying want of the Mississippi valley is well endowed experiment stations. With their aid we may be able to walk without the leading strings, which so far in our history have been furnished us by the nurserymen of the eastern states.—Professor Budd, in *Trans. Miss. Vall. Hort. Soc.*

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### GRAFTING AND BUDDING NOTES.

Professor J. L. Budd relates, in *The Students' Farm Journal*, that part of the same lot of root-grafts of pear, plum and cherry failed to grow, while the rest made a perfect and healthy union. The only difference was that upon the first common grafting-wax was used (the boiled oil in which is believed to have been adulterated with some substance capable of fatally injuring vegetable tissue), and upon the latter the alcohol mixture for grafting, prepared as follows: "Melt six parts white rosin with one part beeswax; remove from stove and partially cool by stirring, then add gradually—with continued stirring—enough alcohol to make the mixture, when cool, of the consistency of porridge. In the temperature of the grafting-room it will remain sufficiently plastic to permit applying to the cut surfaces with the finger."

## CARE OF CIONS OF THE STONE FRUITS.

The subject is worthy of more attention and careful experimentation than it has yet received. An experiment like the following will be conclusive:— Pack away a bundle of cherry cions in November in moderately moist moss, in a moderately moist cellar. In January use these for putting up, say 500 root grafts. At the same time, and with the same roots, put up 500 grafts with cions of the same variety packed in November in dry leaves, in a box in the same cellar. Set by the same man in similar soil, it will always happen that the stand will be from twenty to fifty per cent. better with the dry cions. If the cions be used for top-grafting, or crown-grafting in the open air, the difference in the stand will be far greater in favor of the dry cions.

My attention was first called to this subject in March, 1870. The cherry cions I was using in top-working were cut in November and kept in the cellar in quite dry moss. They were nice and plump, with a show of callusing at the base. I was sure they were in fine order, yet less than five per cent. of them grew. The same day it happened that I put in a dozen or more cions, received by mail from the old homestead in New York. These were so dry that the bark was shriveled, and I only expected to save the variety by the possible growth of one or two specimens; but they all grew. Since that time I have experimented largely with the stone fruits, and am certain that the cions should be kept as dry as is safe. In all cases—unless the cions be scarce and valuable—they are thrown away if they show the least trace of the starting of a single bud or of callusing at the base.

The principle involved is the reverse of our attempts to graft the cherry after the water coming up from the roots has commenced to change the starch of the cell structure of the stock into sugar water. If we expect a uniform and satisfactory union of cion and stock, both must be in dormant condition. The cions of the apple and pear do not absorb

water so readily; yet with these I have known many poor stands to result from the use of water-soaked cions.— Prof. Budd, in *Rural New Yorker*.

Prof. Budd's remarks about the care of stone fruit cions, in the *Rural* of December 27, furnish a text. His statement proves that cherry cions packed in dry leaves are better than those kept in damp moss. So far, good. But I have to relate, from my own experience, a novel plan, which works with entire success; whether it is due to the climate of California I have no means of determining. I used to procure my cions in the fall, and put them away carefully in the approved fashion; then I worked them in the spring, subject to a percentage of loss. Some years ago, running short of prepared cions, I ventured to cut from a Prune d'Agen in the orchard, and within a few minutes the cions were securely grafted on an almond tree, where, to my great gratification, every one of them grew famously and bore fruit. The publication of this result caused the transformation of many barren almond orchards into the French prune. Since then this harum scarum plan has worked so well that I make a point of getting fresh cions—apples, pears, plums, grapes and so on—of neighbors and nurserymen when they have something new, and I put them in as soon as I reach home. I no longer bother about their preservation, and never procure them until I am ready to graft. Possibly this is not news to your horticulturists; but if fresh buds are worked successfully with you, why not cions?— J. B. Armstrong, in *Rural New Yorker*.

I felt some interest in the experience of the *Rural's* Sonoma, California, correspondent, who reports such good results from using freshly cut cions: As I have had similar results here in eastern Ontario, his success cannot, I think, be explained by climatic influence. I commenced cautiously in the spring of 1883, using freshly cut cions (apple). These made such a surprisingly strong growth that I followed, last spring, with several hundred more in the same way, which have done equally well—certainly less than two per cent. failed.— J. G. H., in *Rural New Yorker*.

## APPLE GRAFTS.

Mr. A. Willis, Franklin Co., Kansas, writes: "For two years I have been troubled with what some call fungus growth in the joints of my root grafts. The root appears good and starts nicely, as does the cion, but there is injury in the joint. Those grafted early suffer most." Prof. Budd, to whom the matter was referred, says: "The disease is caused by a fungus growth, and is a common trouble. To prevent it, clean out all old packing material, every autumn, whitewash thoroughly, and use only fresh material for packing.—*Prairie Farmer*.

## TOP-GRAFTING OLD APPLE TREES.

Top-grafting large trees is at best but a harsh and unnatural process, and it should be practiced with caution. If a tree bears moderately good fruit, a grower should consider well before top-grafting it. An apple below the average in quality often makes good pies, sauce or dried fruit. If the apples can be turned to any profitable use, and the tree is twenty years old, it is doubtful if it will pay to top-graft it. Much will depend on the thriftiness of the tree. A man who feeds his orchard, and prunes it regularly and judiciously, need have less hesitation about top-grafting. Trees receiving such treatment will stand a much better chance of fully recovering from the shock of grafting. Much also depends upon the manner in which a tree is grafted.

The old-fashioned way was to graft a few large limbs low down in the tree, and just above a crotch where the remaining branch would "draw up the sap." A man who persisted in grafting in this manner could never operate in an orchard of mine. The newer and safer way to graft is to cut far out on the branches, where they are no more than an inch in diameter, and to set many stubs, and in such positions as to imitate the form of a symmetrical tree. If a main limb branches where it is two or three inches in diameter, graft both branches rather than cut off the limb below the crotch. If a tree has been properly pruned, nearly all the limbs may be grafted. If it has not, many besides the grafted limbs

will have to be removed; and if the tree is old, and especially if a little feeble, it will be likely to suffer. A good grafter will try to leave enough small brush in the center of the tree to screen the trunk and large branches from hot suns. I have often known trees to be seriously injured by sun-scald after having been severely pruned. A tree which would contain seven or eight stubs under the old system of grafting will contain thirty or forty under this system. Two objections will at once be raised to this method: As grafters charge by the piece, it is expensive; it makes the top too high, and makes bean-poles of the main branches. To the first objection, I reply that no apple-grower should hire a grafter; he should be able to do the grafting himself, or else his boys should do it. The second objection is a more serious one. I have seen top-grafted trees whose larger branches were entirely leafless for seven or eight feet, and crowned with a bush. Such trees are of course a nuisance, but they are due to a bungling grafter, not to the plan of grafting many limbs and small ones. There are enough side limbs on the average tree which can be grafted, and this difficulty is obviated. If there should not be side limbs, some of the sprouts which start after the tree is grafted, may be encouraged and grafted in a year or two. One must not expect an old tree to have as good a shape after grafting as before. It can sometimes be secured, but not often.

Old and long-neglected trees which are to be grafted, may often be given a preparatory pruning for two or three years with profit. Unnecessary limbs can be better cut out before grafting than afterward; for after the grafting is done, and so much of the top removed, these limbs grow rapidly and soon show a marked increase in diameter. So much of the tree top will be removed in grafting, that the unnecessary limbs should not be cut away for two or three years, or more, if they are large. It is not always an easy matter to prune a grafted tree properly. The ungrafted limbs must be gradually removed, and the grafts themselves must be trained. The ungrafted limbs should be annually cut away in about the extent to which the grafts grow, or a little more. All

suckers should be removed as they form during the season, unless there is noticed a tendency to sunscald. The suckers may then be needed to shade the trunk and branches. I have known of a few cases in which nearly all the ungrafted branches were taken off the second year, without apparent injury to the tree, but I have known of many more cases in which such treatment has been ruinous. Improper pruning of top-grafted trees often results in an abundance of flat-headed borers. When the tree is weakened, borers attack it. I have several times observed the gradual weakening and final death of large trees which were severely top-grafted. Large trees must have had good treatment before the operation is performed as well as after it. The longer that good culture has been given a tree, the better able will it be to revive vigorously after a thorough grafting. I have so often seen ill results follow from grafting large trees, that I wish to discourage the practice, unless all conditions be favorable. I have often grafted old trees when I was confident that they could never resist the operation, although their owners would not believe it until too late. If the tree is not perceptibly lessened in vigor, it is at least probable that it will be made a sprawling and unsatisfactory object. — Prof. L. H. Bailey, Jr., in *Country Gentleman*.

#### HOW TO DESTROY OLD ORCHARDS.

Useless old orchards bearing seedling fruit occupy valuable soil all over the country. Do not attempt to graft them for it will not pay. Destroy them at once and plant young trees. Some people get tackle and pull such trees over by hitching to the top. Others dig about and cut the roots, then fasten a rope from the top to the axle of a wagon loaded with stones. Our method is to dig about and sever the roots branching out, then let the wind blow them over. The fall and winter winds will never fail — they will push harder than any half dozen teams. Think of the forest trees the winds tear up. We have tried this method and recommend it. Only keep from under them when the wind blows.—*Green's Fruit Grower*.

"TIGHT LACING" OF TOP-WORKED STOCK.

On account of trouble at the west with the stems of cherry trees, the Miner plum has been recommended as a stock on which to top-work the Richmond cherry and other varieties doing well with us. The cherry takes well on the Miner stock. A nice top is formed early in the season, but the stock fails to increase in size and soon dies — root and all — from sheer starvation. At first I suspected want of affinity, and perfect union of stock and cion, but closer inspection revealed the fact that the heading back of stock and the dormant condition of the cambium layer and bark during the first stages of the growth of the cion, so hardened the naturally elastic epidermis as to totally prevent expansion and growth when the time came for a new wood deposit.

To prove the correctness of this belief, we planted six one-year-old Miner plums in our experimental orchard, and top-worked them, the next March, with cions of a fine cherry, from the east plain of Europe, known as "Bessarabian." All the cions grew rapidly. In June the tough outer bark of one of the stocks was slit on the north side, to permit expansion. This is now a fine tree with a clean, healthy stem and a fine, round top loaded with blossoms. The five trees untreated had nice tops in the fall, which had outgrown the dry, dead-looking stocks, and by the middle of the next summer they were all dead without apparent increase of diameter of stock.

In like manner I find that plum grafted on plum, and cherry on cherry,— where the top is entirely cut back in putting in cions— show a tendency to a hardening of the tough epidermis and to constriction and disease of stem. In some cases we have entirely removed the outer bark; in others merely slitting it to permit expansion has answered.

I should add that in top-grafting young apple and pear trees, we notice in our climate the same tendency to the hardening of the bark and a constriction of woody tissue, which is materially obviated by cutting the "corset strings."

But my purpose at present is to direct attention to the

Miner Plum as a stock for the cherry in the west.—Prof. Budd, in *Rural New Yorker*.

Young experimenters who have been laudably trying to establish at their own homes some fine sort of fruit by the simple process of inserting buds, can readily tell whether the budding has been successful even before they loosen or remove the ligature. If the short bit of leaf-stem left on the bud drops off at a touch leaving a flat, even disc of separation as when a leaf falls naturally, the bud has taken and has become a part of the tree it was inserted in. If shriveled and not readily detachable it is a failure. Buds that are sliced from quite ripe, plump, firm shoots, late in August or September, and neatly placed and tied in a thrifty shoot in which the bark separates freely so late as that, very rarely fail.—Blairco, in *New York Tribune*.

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## PRUNING NOTES.

### TIME FOR PRUNING YOUNG TREES.

The frequent injury caused to young fruit trees, and especially to those recently transplanted, induces us to repeat the advice to do whatever shortening-back may be required before growth commences. We have seen young honeylocust hedges also nearly ruined by cutting-back after growth had commenced. A row of young apple trees three or four years old was planted in a new position, and the shoots were cut back after the leaves were an inch long. Not one of the trees grew two inches that year, while a growth of six inches or a foot would have been made had the pruning been done earlier, as other trees transplanted at the time indicated. Some trees are less injured by such treatment than others, and sooner recover, as for instance the peach and the osage orange.—*Country Gentleman*.

### PRUNING ORCHARDS IN WINTER.

An apple orchard which has been well managed from the beginning, needs very little pruning afterward. Needless



shoots are rubbed off as soon as they make their appearance, with a tenth of the labor required subsequently for their removal with the saw. But this timely work is not always performed, and many trees have become dense in their tops, which sometimes present the mass of brush represented by fig. 1. It is advisable in such instances to thin



Fig. 1. Unpruned Tree.

them moderately and gradually, in successive seasons. It is common to cut too much at a time. But a greater fault is to thin the interior and to leave the outside as thick as ever, as shown in fig. 2. This mass of brush excludes the



Fig. 2. Wrongly Pruned Tree.

sunlight, the twigs and leaves are small and crowded, and as a consequence the fruit is small and defective. The tree being made taller by this treatment, and the branches successively run up to a height, the fruit is more difficult to

gather, and the windfalls are bruised in falling. The proper course is to thin in from the outside, to let the sun in to every part, as represented by fig. 3. Every portion of the



Fig. 3. Correctly Pruned Tree.

head, and not the outside merely, thus receives the benefit of the sun's rays, and the leaves and fruit have room to become fully developed.

There are some details of the work which can be learned only by experience and by observing the requirements of trees of different forms and habits of growth. It may be observed, however, as general rules, that the remaining branches should be as evenly distributed through the head as practicable, and that the limbs be not run out in long, bare poles, but sufficient side branches retained to give a good general shape. It is well to remember that it is better to prune too little than too much, and that pruning cannot be successful if cultivation or top-dressing with manure is neglected.

This operation of pruning, when required, may be done any time in winter in regions where there is no danger of injury by intense cold, wounds always rendering trees more tender. But there will commonly be little danger if the pruning is quite moderate, as it always should be. In very cold regions it may be well to defer the work till the approach of spring, but it should be always done before the buds swell, when pruning would check growth. The wounds may be protected from rains and decay with a coat of paint.— *Country Gentleman*.

## PAINT AND TREES.

A pot of paint really costs but a few cents, and may be made to save many dollars' worth of trees. When wounds and the stumps of limbs which have been cut off are covered with paint, the wood will be preserved until it heals over; whereas, when not painted, it is liable to rot and weaken the tree, causing premature decay and death. I think too much of trees to neglect them, and lose the care and waiting of years on account of the work of a few moments.—F. D. C., in *Rural New Yorker*.

## SPLITTING AT FORKS.

Various devices or remedies are given in the papers from time to time, to prevent forked apple-trees from splitting. Iron bolts are inserted; iron bands are employed; ropes are used to draw the parts together; branches are drawn together and interlaced, etc. Prevention is best, and well-formed heads will not split down. Two main branches, diverging from each other at an acute angle, should not be permitted. An even and spreading head will not split, nor will any tree be liable to injury if not allowed to overbear. The practice of propping up the limbs of fruit trees indicates that the trees are not well trained, or that they are allowed to overbear, or both.—*Country Gentleman*.

Crotched fruit-trees of any kind can be kept from splitting down by twisting together one twig from each of the main branches. These thus twisted will in five years grow into a solid branch that cannot be broken. Twigs which grow from the lower part of the branches are preferable. If there are no such twigs on the branches, a 'water sprout' or 'sucker' should be allowed to grow; or one may be started by nicely inserting a cion into a slit between the bark and wood, and securely waxing it. Twigs from the size of a lead pencil to half an inch in diameter can be used for this purpose.—*Florida Dispatch*.

## PROTECTION FROM MICE AND RABBITS.

Take very small pieces of tallow for the former, and carrot for the latter; put into each one-tenth of a grain of strychnine, and drop the pieces where the vermin frequent. Two doses for the winter will prove effectual.

The frequent snows render it necessary to follow up the remedy faithfully, and, especially in grass land, the snow should be trampled around the base of the trees to prevent mice from working around under the snow. For want of these precautions the labor and waiting of years may be spoiled by these garden pests.—J. C. P., in *Western Farmer*.

Professor J. L. Budd, as a cheap and easy preventative of girdling by mice in winter, advises piling before the ground freezes "a small neat mound of soil around each tree of the young orchard." To properly protect as many as two hundred in this way would, he tells the *Iowa Register*, be a light day's work.—*New York Tribune*.

The best way is to tie about the trunk strip laths or barrel staves, cut  $1\frac{1}{2}$  or 2 feet long. These are a perfect protection from woodchucks, rabbits, mice and borers, cheap and easily applied. The writer has used them for 15 years in a large orchard, and never lost a tree from any of the above causes, while other orchards near him have been almost ruined by them.—*Rural New Yorker*.

Dr. Sanborn stated, at a meeting of the Illinois horticultural society, that he protected completely from rabbits and mice his 600 pear trees, with a wash of lime and water, with enough copperas added to change the color to a deep green. Some cheap glue was added to make it adhere to the trees. Neither rabbits nor mice would touch the trees thus treated.

Mr. Alfred Smith, the venerable and honorable pomologist of Monmouth, Me., shows an apple tree, large enough to bear a bushel or two of fruit, which three winters ago was completely girdled by mice. There is now little mark left of the damage, some cions having been slipped into

the bark below and above the wound at grafting time in the spring, after the injury was discovered.—*New York Tribune*.

Trees girdled by mice may be saved by banking over the injury with earth; if done before the wound gets dry a continuous bark will form and leave no scar. I have saved trees six inches in diameter that were completely girdled a foot or more in height. If done in season it will generally save the tree.—A. G. Tuttle in *Western Farmer*.

### TINEIDAE INFESTING APPLE TREES AT ITHACA, NEW YORK.\*

The following is a list of the Tineidae which I have found infesting the apple trees at Ithaca.

1. *Lithocolletis crataegella* Clemens.
2. *Ornix prunitorella* Chambers.
3. *Aspidisca splendoriferella* Clemens.
4. *Tischeria malifoliella* Clemens.
5. *Bucculatrix pomifoliella* Clemens.

Besides these it is probable that another important species, the Apple Coleophora (*Coleophora malivorella* Riley), will be found here, as it occurs in orchards near Rochester and Geneva. From all but the third (*Aspidisca splendoriferella* Clem.), I have bred one or more undescribed species of hymenopterous parasites. These were referred to Mr. L. O. Howard, who has studied them and kindly furnished me with his manuscript names of the species.

#### THE SPOTTED TENTIFORM MINE OF THE APPLE.

(*Lithocolletis crataegella* Clem.)

Plate I, Figs. 1—1d.

Larva on the under side of apple leaf, making a tentiform mine which has the upper surface spotted or honeycombed, and pupating in one end of the mine.

About the middle of September the leaves of the apple trees were found to be mined by a yellowish larva which

\*We are indebted for the figures used to Professor Comstock.

fed on the under surface of the leaf in a tentiform mine, and which proved to be *Lithocolletis crataegella* Clem. These mines (Pl. I, Fig. 1a.), are spotted or honeycombed on the upper surface; the lower surface is formed of silk spun on the lower surface of the leaf. This silk turns brown when old, and is the only silk in the mine while the larva is feeding. The spotted or honeycombed appearance of the upper surface of the mine referred to above, is due to the way in which the larva feeds. It will eat a little in one place and then move off to some other part of the mine and eat a little there. Even the smallest veinlets are not destroyed, and usually the parenchyma along the veinlets is left undisturbed, the larva eating only a small portion of the parenchyma included in the cells formed by the smallest veinlets. If the miner has not been very voracious considerable patches of parenchyma will still be left, while on the other hand, in some cases the venation of the leaf will show plainly in some parts of the mine. Where the miner has eaten, the upper epidermis has a dirty whitish appearance. The frass, in the shape of rounded pellets, is collected in a string-like mass in some part of the mine.

When about to pupate the larva goes to one end of the mine and weaves a loose silken covering, usually quite dense, around itself. Inside of this it casts its larval skin, and remains a pupa over winter. I have collected the pupae as early as September 27th, and the larvae as late as October 18th. In the spring the pupa forces itself nearly out through the lower surface of the mine and there gives forth the moth.

This insect is not very abundant, but somewhat more common than the following species (*Ornix prunivorella* Chambers). When abundant enough to injure the trees the proper remedy would be the one suggested by Prof. J. H. Comstock in the case of *Lithocolletis hamadryadella* Clem.,\* which is to gather and burn the fallen leaves. In this way all the hibernating pupae would be destroyed.

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\* U. S. Agricultural Report, 1879, p. 230.

Below I give descriptions of the larva and pupa; also Chambers' description of the adult.

**LARVA** (Pl. I, Fig. 1 b). Length 5 mm (.2 in.). Form cylindrical. Head longer than broad, wedge-shaped, quite pointed and bilobed. First thoracic segment twice as wide as the head. Second thoracic segment wider than the first and as long. The segments following decrease in width and length until we come to the third, fourth and fifth abdominal segments which are as wide and as long as any of the segments. After these the segments taper again quite markedly. When the larva is young the third, fourth and fifth abdominal segments are relatively not as large as when the larva is full grown, and hence it has the appearance of tapering from the second thoracic segment to the rear. Color: light yellow throughout. Thoracic, abdominal and anal legs present. Hairs on the segments numerous and long. One dorsal and two lateral rows of hairs on each half of the body. On each abdominal segment excepting the last, the dorsal row of hairs is composed of two hairs, a long and a short one, the shorter being placed in front of the longer. Around the anal opening and projecting backwards are six incurved hairs.

**PUPA** (Pl. I, Figs. 1 c and 1 d). Length 3.4 mm (.15 in.). Length from head to end of antennal sheaths 2.8 mm (.11 in.). Greatest width .8 mm (.03 in.). Antennal sheaths and wing cases extending down as far as shown in the drawings. When the pupa is contracted, however, the third segment from the last is drawn up nearly out of sight, thereby causing the sheaths of the appendages to appear to extend down farther. Head furnished with rather a pointed beak. The anal segment has at its extremity two small, strong, excurved tentacles or hooks. The ventral surface of the head bears two long, straight, rather stout hairs. There is on each side of the pupa a complete and an incomplete row of hairs, and on each side of the dorsal surface another row of hairs. Color: yellow, with the head and dorsal surface light brown. Sometimes there is more brown than yellow.

**ADULT** (Pl. I, Fig. 1). Fore wings golden brown, with media and dorso-basal white streaks, which are frequently continued on to the thorax. Face and under side of antennae silvery white. Tuft brownish. A white streak extending along the base of the dorsal margin as far as the basal fourth of the wing length. Black apical spot. Hinder marginal line at the base of the cilia. Three dorsal and four costal streaks, the third dorsal minute, the second large and the first very large. First costal very oblique and fourth pointing obliquely forward. First costal and first and second dorsal streaks dark margined on both sides, the others only dark margined before. The dark margining of the dorsal and costal streaks frequently extend back to the apical spot. Alar ex.  $\frac{1}{16}$ . to  $\frac{1}{8}$  in.







*Natural enemies.*—From this species I bred two undescribed chalcid parasites, *Sympiezus lithocolletidis* Howard MSS. and *Eulophus minutus* Howard MSS.

THE UNSPOTTED TENTIFORM MINE OF THE APPLE.

(*Ornix prunivorella* Chambers.)

Pl. I, Figs. 2—2c.

Larva on the under surface of apple leaves making a tentiform mine, eating the parenchyma clean, and pupating at the edge of the turned-up leaf in a silken cocoon.

At the same time that I found the mines of *Lithocolletis crataegella* I also found in connection with them, often on the same leaf, mines which I at first was not able to distinguish from them; but containing quite a different larva, and which proved to be *Ornix prunivorella* Chambers. After a little examination, however, the difference between the two was very evident. While the mine of *L. crataegella* has on the upper surface a honey-combed or spotted appearance, and the venation of the leaf does not show plainly; the mine of this insect (Pl. I, Fig. 2b) does not appear spotted and shows the venation of the leaf quite distinctly. Moreover, while the larva of *L. crataegella* eats the parenchyma in spots and leaves the upper epidermis of a whitish color; the larva of *O. prunivorella* eats the parenchyma clean as it goes and leaves the upper surface of the mine brown.

As my observations commenced rather late in the fall, I was unable to observe the larvae when young. When nearly mature they leave the old mines and make new ones. To describe in a few words the way they proceed in making these new mines: quite a dense but still very transparent silken covering is spun on the under side of the leaf, and as a rule enclosing more space than *L. crataegella*, this being a larger larva. While weaving these threads from side to side over the space to include the so-called mine, the larva rests on the threads already spun. In this way the larva may by its weight (?) aid in causing the mine to assume its tentiform shape. When this covering is completed the larva crawls in between it and the leaf and completes the mine from the

inside by spinning more threads from side to side and drawing the edges of the mine very close together. The under surface of the mine thus becomes more opaque from more silk being spun there, and also as the silk itself which is at first white becomes brown.

Soon the larva commences to feed, beginning at one end of the mine and eating everything clean as it goes, excepting the small veins and upper epidermis.

When through eating, or when all the parenchyma in the mine is eaten, the larva leaves the mine by an opening which it makes in the under surface, and either pupates in another portion of the same or a different leaf; or if not through feeding it makes a new tentiform mine on the disk of the leaf, or turns over the edge of the leaf and feeds on the infolded portion. I have known the larva after leaving the old mine to turn down the edge of the leaf on the upper surface twice in order to feed. In some cases where the mines were opened, but still not much of an opening made, the larvae closed this opening and went on feeding, while in other cases if so disturbed they made new mines or else pupated. The larvae deposit the small, rounded pellets of frass in an irregular heap in one end of the mine.

When about to pupate the larva leaves the mine through a small circular hole which it makes at one end and on the under surface of the mine, goes to some portion of the edge of the leaf, either on the upper or lower surface (very seldom on the lower), folds the edge over itself, bringing it close down to the surface of the leaf by silk, and then spins around itself in this roll a delicate silken cocoon. Within this cocoon it casts its larval skin and transforms to a pupa, remaining in that condition throughout the winter. It takes less than twenty hours for the larva to make the roll within which it pupates. In exceptional cases the larva will spin its cocoon in the fold of the leaf caused by its mine and at some distance from the edge of the leaf. Often the larva goes to the very tip of the leaf, and brings the two edges together, making its cocoon within this fold. The pupae, I have collected as early as October 3d, and the larvae, as late as October 26th. A young, white larva which I collected

November 6th, turned gray upon placing it in alcohol. In the spring the pupae transform to dark steel gray moths, which when at rest assume the position shown in Pl. I, Fig. 2a.

The mines are common here at Ithaca, but not abundant. They are not sufficiently numerous to injure the trees, although I have several times counted as many as five in a single leaf. If they should become too numerous the same remedy would apply here as in the case of *L. crataegella*.

Below are given descriptions of the larva and pupa, and Chambers' description of the adult.

**LARVA.** (Pl. I. Fig. 2c). When full grown 6.8 mm (.27 in.) in length. Color, grayish; when young flesh colored. Head light brown and about one half as broad as the first thoracic segment, which is light yellow. Form cylindrical with the last three or four segments of the abdomen tapering slightly. With the exception of the head and first thoracic segment there are on the dorsal surface four longitudinal rows of white elevations, each segment having at or near its middle one of these elevations in each row. There are also two rows of similar elevations on each side of the larva. Towards the caudal end of the larva the two middle dorsal rows run together. Other rows of tubercles disappear in the last abdominal segments, leaving fewer white elevations on these segments than on the others. From each of these elevations arises a hair of considerable length. On or near some of these tubercles of the middle dorsal rows arises a second, but quite short hair. Also numerous small hairs on the head, first thoracic segment and anal segment. Upon the dorsal surface of the head are four very black conspicuous spots, and on each lateral surface an indistinct one. Also on the dorsal surface of the first thoracic segment are four similar but larger black spots. Thoracic, abdominal and anal legs well developed. The thoracic legs have the outer surface almost entirely black and smooth, while the inner surface is gray and furnished with hairs. Abdominal and anal legs of same color as the larva.

**PUPA.** (Pl. I. Fig. 2d and 2e). Length from head to the end of the antennal sheaths 5 mm. Breadth at widest part 1 mm. Antennal sheaths extending beyond the anal segment. Head furnished with quite a prominent beak. Two rows of hair on the dorsal surface and two on each side; the lower row on the sides being made up of two hairs, placed close together on each segment. No hairs on the head. Color: brownish yellow, with exception of the beak which is black and the dorsal surface which is brown or dark brown. The color of the dorsal surface is due to a roughened rectangular brown patch on all of the abdominal segments but the last, each patch taking up the greater part of the dorsal surface of the

segment upon which it is placed, extending nearly to the sides and almost to the following segment. These black patches can readily be seen even in the cast off pupa skin.

ADULT. (Pl. I. Fig. 2 and 2a). Dark steel gray, almost brown. Labial palpi white, each joint tipped externally with a dark steel gray. Antennae of the general hue, faintly annulate with whitish. Thorax and primaries dark steel gray, the primaries with about nine faint whitish costal streaks, the first near the base and the last at the apex, becoming gradually longer from the base to the apex, all faintly dark-margined internally, the last three or four nearly perpendicular to the costal margin; crossing the wing and uniting near the dorsal margin, where they are narrow and indistinct. A small black apical spot, behind which are three dark hinder marginal lines in the cilia; the second at the middle, the third at the apex and the first at the base of the cilia. The one at the base of the cilia becomes furcate in the dorsal cilia. Al. ex.  $\frac{1}{2}$  inch.

*Natural enemies.*—From this species I have bred two undescribed chalcid parasites, *Sympiezus lithocolletidis* Howard MSS. and *Eulophus minutus* Howard MSS.

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#### THE RESPLENDENT SHIELD BEARER.

(*Aspidisca splendoriferella* Clemens.)

Mining the leaves of apple twice a year, and cutting out an oval case which it carries to the trunk or limbs, and attaches; a minute, whitish, footless larva, with a brownish head, and a yellow-brown spot on each segment.

The life history of this insect has been so well described and figured in the Annual Report of the department of Agriculture for 1879, by Prof. J. H. Comstock, that it would be of little or no value for me to go over the same ground. This insect is much less common than any of the other four species of Tineidae infesting the apple trees at Ithaca. Evidently then no remedy is as yet needed, but it is well to bear in mind how abundant they may become, although perhaps in this latitude (Prof. Comstock's observations having been made in Washington), our winters may be too severe for them. If however, the species found by Lord Walsingham mining Poplar leaves in Oregon\* proves to be identical with this species some other reason than cold climate must be as-

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\*Chambers' "Tineina and their food plants," p. 107.

signed for the small number of this Tineid here. From recent information received from Washington, I have reason to believe that, owing to the remedies used in the Department grounds for this pest, they are hardly more abundant there than here; which speaks very well for the remedy. The substance used was presumably that mentioned in the Agricultural Report for 1879, p. 212, namely, a mixture of one half bushel shell lime and six pounds of powdered sulphur, dissolved and brought to the consistency of a white-wash with hot water, and applied to the trees.

It is said of the hibernating larva (the only form which I have been able to examine), in the report for 1879, "no hairs observable." Those specimens which I examined had two lateral hairs on each side of the thoracic segments, and one hair on each side of the abdominal segments; also ten hairs on the anal segment. The position and number of these hairs agree with those of the full grown mining larva; but as they are very minute indeed, it is not surprising that they were not observed. Also numerous hairs on the head, and four dorsal hairs on the first thoracic segment.

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#### THE TRUMPET MINE OF THE APPLE.

(*Tischeria malifoliella* Clemens.)

Pl. II, Figs. 1 to 1d.

Mining the upper surface of apple leaves, making a brown, trumpet-shaped mine scarcely observable from the under surface of the leaf; a greenish, footless, but active larva.

Many of the apple leaves in the fall were found to have very conspicuous brown spots, which being on the upper surface could be seen at quite a distance from the tree. Upon closer examination they assumed definite shapes and proved to be caused by the mining of the larval form of *Tischeria malifoliella* Clemens. The mine (see Pl. II, Fig. 1a), commencing in a glistening spot where the egg was laid, continues for a short distance as a narrow line, gradually growing wider, and then suddenly broadening out into an irregular expanded portion or "body of the mine," the

whole having a trumpet shaped appearance. The color of the mine on the upper surface is usually some shade of brown, although I have sometimes observed it to be dirty white. From the under surface of the leaf the mine would hardly be observed unless held up towards the light or examined closely, when the mined portion of the leaf would be seen to be of a lighter shade of green than the rest. The linear portion of the mine on the upper surface is crossed by crescent shaped patches of white, which in many cases are continued for a short distance into the body of the mine. Often the miner, after commencing the body of the mine, will turn and eat around the linear portion, obliterating that part and causing the mine to appear like a blotch mine. In such cases the white crescent shaped patches will be found somewhere in the body of the mine indicating the position of the linear portion. These white markings are, however, wanting in some instances; but as the color of the linear portion of the mine is a little darker brown than the rest, we can still tell where the mine commenced. The position of the mine on the leaf is variable; it may be along the edges of the leaf, causing it to curl over at that point, or along the midrib, or else between these points. As the leaf dries the mine assumes a tentiform shape.

Within the mine we find a light green, active, footless larva. If any foreign body is brought into contact with the long hairs covering the larva, it will be observed to support itself by some of its middle segments and rapidly vibrate the rest of the body, this probably being the only way to frighten off parasites. In connection with this it is worthy of note that *Ornix prunivorella*, when approached in the same way, fastens itself by its thoracic and anal legs and vibrates the middle of its body.

The upper and lower surface of the mine of *T. malifoliella* are densely lined with silvery white silk. The excrement is deposited without the mine through one or more openings, which are situated at one end and on the lower surface of the mine. Within these clean and comfortable quarters the larva passes the winter. In the spring the larva transforms to a pupa at one end of the mine, making no cocoon,

and in a short time forces its way partly out through the upper surface of the mine, and there gives forth the moth. The tearing of either surface of the mine causes the larva to die, as it seems bound to get out if it can, and once out it can neither return nor build a new mine.

This insect is the most abundant of the Tineidæ infesting the apple trees at Ithaca, nevertheless it is not abundant enough to do them any material injury. The remedy, "collecting and burning the orchard leaves in the fall," would apply here as in the case of *L. crataegella* and *O. prunivorella* if they should multiply too rapidly.

Below is a description of the larva, and Clemens' brief description of the adult.\*

**LARVA.** (Pl. II, Fig. 1b). Length, 5 mm. (.2 in.). Head small, pointed, retractile and bilobed. Form flattened and tapering to the rear from the second or third thoracic segment. First thoracic segment twice as wide as head but not as wide as second thoracic segment. The last three abdominal segments are rounder and considerably narrower than any of the others. Between the first and second, and second and third thoracic segment are distinct folds. General color light green, with a brown or even black head. The large dark markings represented in the figure on the first thoracic segment are internal. No true legs, but four pairs of not very prominent prolegs, also anal legs. Three hairs on each side of the thoracic segment and two on each side of the remaining segments. Tentaculiform appendages and numerous hairs on anal segment. Plate II, Fig. 1c. On each side of the dorsal surface of the third, fourth, fifth and sixth abdominal segments there arise from the same point two short stiff hairs. A prominent ridge on each side of the lower, and two deep depressions on each of the thoracic segments.

**PUPA.** Unknown. This tineid proved very difficult to rear. Out of about one hundred mines gathered last fall, but four moths emerged. Owing to the fact that the larva dies if the mine is opened, I hesitated about opening many mines and am therefore unable to describe the pupa.

**ADULT.** (Pl. II, Fig. 1). Head and antennae shining dark brown, face ochreous. Fore wings uniform, shining dark brown with a purplish tinge, slightly dusted with pale ochreous; cilia of the general hue. Hind wings dark gray; cilia with a rufous tinge. (Clemens).

The Alar ex. is 7.5 mm. (.3 in.).

**Natural enemies.**—From this species I bred two undescribed chalcid parasites, *Sympiezus lithocolletidis* Howard MSS. and *Astichus tischeriae* Howard MSS.

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\* Tineina of North America, Clemens, p. 141.



## THE APPLE BUCCULATRIX.

*(Bucculatrix pomifoliella Clemens.)*

Pl. II. Figs. 2—2e.

Mining apple leaves for a short time, then feeding externally and making an elongated white ribbed cocoon, which may be found attached to the trunks and limbs of the trees.

As this Tineid is not abundant enough here to make accurate observations upon it, a quantity of cocoons containing living pupae were sent to me by Mr. J. Fred. Rose, of South Byron, N. Y., the past winter. The cocoons were kept in a cool room to prevent the moths from emerging before the leaves of the apple trees were out. On May 15th about one dozen moths emerged. These together with the remaining cocoons were placed on an apple limb inside a Swiss muslin netting. Three days later, between 5 and 6 P. M., some moths were observed to be pairing. From this and subsequent observations I believe this moth to be most active in the evening.

The greenish colored eggs are laid scattering on the under surface of the leaf. The eggs commenced to hatch June 16 or 17,\* and the larvae bored directly from the egg to the upper surface of the leaf, where they made a small brown serpent mine. After the larva leaves the egg the shell collapses and turns black. If the egg shell be removed the circular opening made by the larva entering the leaf can be seen. The mine is usually but 1 mm. ( $\frac{1}{8}$  in.), broad at its largest end. Where the mines are abundant on a leaf, it turns yellow and dies. On a small leaf I have counted twenty or more mines. The frass is deposited along the middle of the mine. When the larva has made a mine from  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, which it does in from four to five days, it eats its way out through the upper surface, then somewhere on the upper surface of the

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\*The great length of time (1 month) between the pairing of the moths and the hatching of the eggs, I attribute principally to the cold weather during that period, the average of the mean daily temperature from May 21st to June 21st being 61°. The mean daily temperature was derived by taking the sum of the morning and noon temperature once and the night twice and dividing by four.

leaf it weaves a circular silken covering about  $\frac{1}{4}$  in. in diameter. Stretched out on this network, the larva, which is now 2.6 mm. long, makes a small hole in it near its edge, then, as one would turn a somersault, the larva puts its head into this hole and draws its body after. Arriving inside the "molting cocoon" as it may be termed, on its back and doubled in the shape of a horse-shoe, the larva is then ready to strengthen the cocoon and close the opening which it made in entering. The larvae make these cocoons in from fifteen to thirty minutes; and usually within a couple of hours after leaving the mine. After the desertion of the mine and before the making of these cocoons, the larvae eat nothing, but may be found crawling over the leaves, stems and branches and often suspended by silk threads. On the 24th of June many of the cocoons were empty, the larvae having molted, leaving their cast-off skins in the molting cocoons, and cut their way out. The larvae remain in these cocoons in most cases less than twenty-four hours. The larva before molting is readily distinguished from its later stages by its yellow color and a large black spot on its first thoracic segment. After molting the first time the larva becomes dark green and has a number of small black spots on the first thoracic segment.

After leaving the cocoon it commences to feed externally, crawling everywhere and often suspended from the leaves by a silk thread. While feeding it lies stretched out at full length on the upper surface of the leaf, eating the upper epidermis and parenchyma in small patches, but leaving the lower epidermis, which turns brown. A few days after the larvae left their molting cocoons, I observed a few quite large molting cocoons. Suspecting that they might be cocoons in which the larva molted the second time, as the larvae within them were greenish and not yellow, I placed some of the yellow larvae, which had just left their mines, in a bottle with fresh apple leaves. After making molting cocoons and molting, they fed for two and a half or three days and then made a second cocoon which differed from the first only in size, being about one-eighth inch in diameter. These second cocoons are made and entered in the same

way as the first ones, and the larva remains on its back inside them for two days, when it forces its way out, leaving its second cast-off skin in the cocoon, and goes on feeding as before. The only subsequent molt is when the larva transforms to a pupa.

Three weeks after the eggs commenced to hatch, the larvae commenced to make elongated white, ribbed cocoons (Pl. II, Figs. 2a and 2b), within which they transformed to pupae. The cocoons on a badly infested branch are placed side by side in patches on one side (the lower I am told) of the branch. The moths begin to emerge July 18th, the pupae having forced themselves partly through one end of the cocoon and there given forth the moths.

Owing to the necessity of my leaving Ithaca at this time, I was unable to continue my observations. If there is a second brood, which I think is the case, the larvae would probably be making their cocoons by the middle of September, and, changing to pupae, remain in that condition over winter. I found cocoons containing living pupae the latter part of September of 1881.

This insect has become very injurious in some localities. Scraping the trunk and cutting and burning many of the smaller branches would doubtless do some good. But other observers state that the larvae will often wander off and attach their cocoons to objects other than apple trees. In such cases the above treatment would not be sufficient. Probably the only effective remedy would be to sprinkle the foliage of the apple trees with some poisonous solution while the larvae are feeding, namely, in the latter part of June.

Below are given descriptions of the eggs, larva, and pupa; and Clemens' description of the adult.

EGG. Outline oval. Color identical with the leaf. Surface rough and iridescent. Length  $\frac{1}{2}$  mm. Width a little more than one-half the length. When hatched the shell collapses and turns black.

LARVA (*after leaving the mine but before molting*). Length about  $2\frac{1}{2}$  mm. Width uniform,  $\frac{1}{10}$  mm. Form cylindrical. Thoracic, abdominal and anal legs well developed. Head a little more than one half as wide as the first thoracic segment. On the dorsal surface of the first thoracic segment is a dark brown or black spot which can be seen even while the larva is in the mine. The first thoracic segment can be lengthened or

shortened by the insect if desired. All the abdominal and thoracic segments are of very nearly the same length excepting the seventh abdominal segment, which is longer than any of the others. Depressions on the sides of the larva seeming to indicate a lateral ridge. Numerous hairs on all the segments, but small and inconspicuous excepting one on each side of all the segments. Color: light yellow, excepting the head, which is entirely brown, and the legs which are partly so.

*LARVA (after molting once).* Length about 2 mm. Body slightly narrower than before. Head nearly as wide and longer than the first thoracic segment. First thoracic segment contracted behind. The large spot on this segment has given place to an indefinite number of small spots irregular in outline, but quite symmetrically arranged. The outlines of the segments on the sides are not so rounded as before molting. The surface of the larva has drawn up into folds and tubercles. From each tubercle arises a black stiff hair which in most cases is quite long. There are six hairs on the dorsal surface of each abdominal segment, arranged in two transverse rows, four hairs in the anterior row and two in the posterior. Also two hairs on each side of the segments. The anterior margin of the first thoracic segment is whitish and furnished with about eight long hairs projecting forward, reminding one very strongly of a spiked collar. The color of the larva has changed to a green while the head has become light brown, with a dark spot on each side.

*LARVA (after molting the second time).* Length  $2\frac{1}{2}$  mm. and increasing to 6 mm. before pupating. Form and color as before. Markings on first thoracic segment arranged in three transverse rows. Head and thoracic segments have in most cases a reddish tinge. Lateral ridge becomes more distinct, consisting of the whitish tubercles placed close together.

*PUPA.* (Pl. II, Figs. 2d and 2e.) Length, 2.8 mm. Width, .7 mm. Form cylindrical. The last five abdominal segments may be drawn up in the spring so far that the hind tarsal sheaths project beyond them. Length from head to end of posterior tarsal sheaths 2.3 mm. The relative lengths of the other appendages as in drawings. Head armed with a strong, sharp, chisel-shaped beak. On each side of the anal segment is a very stout, short and sharp spine. Hairs not numerous and not readily seen. Color: black, with the exception of the ventral surface and the sheaths of the appendages which are brown.

*ADULT.* (Pl. II, Fig. 2). Head and face very pale ochreous, with the tuft tipped with brownish. Antennae pale ochreous, dotted above with dark fuscous. Fore wings whitish, tinged with pale yellowish, freely dusted with brown. On the middle of the inner margin is a large, dark brown oval patch, forming with its opposite, when the wings are closed, a conspicuous, nearly round dorsal patch; a streak of the same hue from the costa opposite it running to the inner angle of the wing, and tapering from

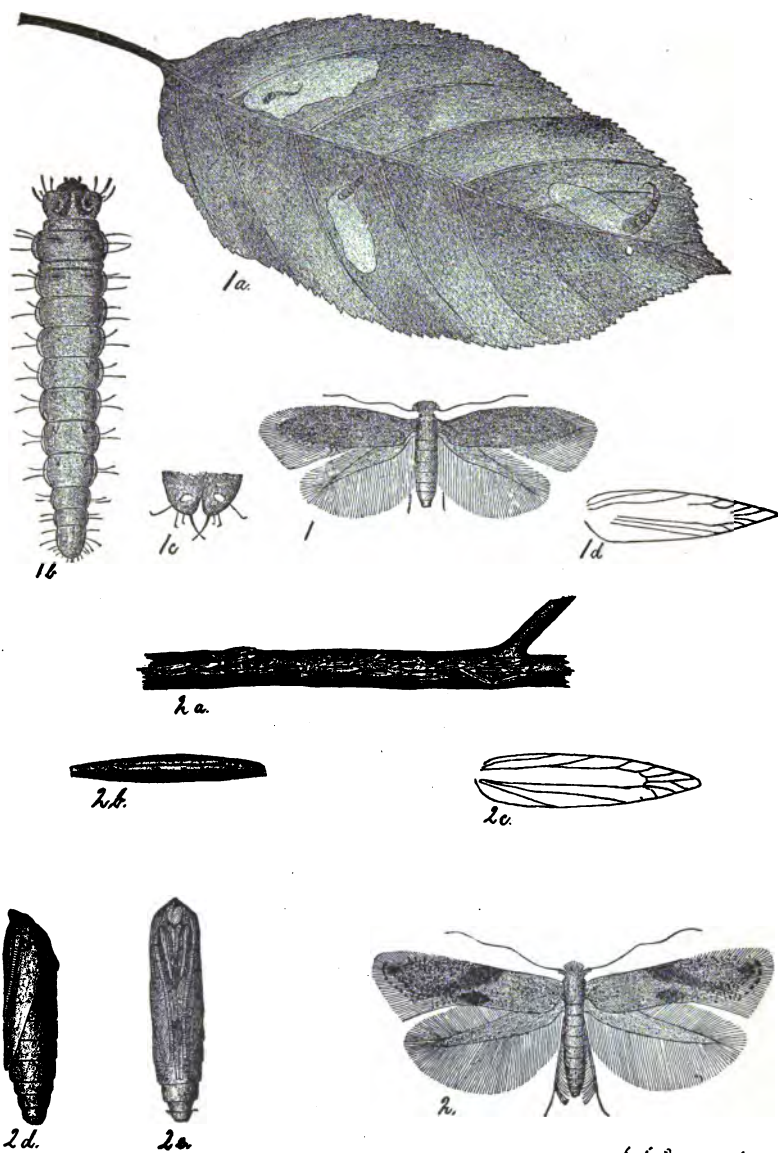
the costa where it is broadest. At the tip is a round, dark brown apical spot, and in the cilia a dark brown hinder marginal line. Hind wings pale, brownish ochreous, cilia the same. (Clemens).

*Natural enemies.*—From a case of this species I bred an undescribed chalcid parasite, *Eupelmus bucculatricis* Howard MSS.—

A. E. Brunn, in 2 *Rept. Cornell Univ. Exp. Sta.*

### EXPLANATION OF PLATES.

- Pl. I, Fig. 1. Adult *Lithocolletis crataegella* Clem.  
 “ “ 1a. Leaf of apple showing mine of *L. crataegella*.  
 “ “ 1b. Larva of *L. crataegella*.  
 “ “ 1c. Lateral view of the pupa of *L. crataegella*.  
 “ “ 1d. Ventral view of pupa of *L. crataegella*.  
 “ “ 2. Adult *Ornix prunivorella* Chambers.  
 “ “ 2a. Position of *O. prunivorella* when at rest.  
 “ “ 2b. Apple leaf showing mines and cocoons of *O. prunivorella*.  
 “ “ 2c. Larva of *O. prunivorella*.  
 “ “ 2d. Lateral view of pupa of *O. prunivorella*.  
 “ “ 2e. Ventral view of pupa of *O. prunivorella*.
- Pl. II, Fig. 1. Adult *Tischeria malifoliella* Clemens.  
 “ “ 1a. Leaf showing mines of *T. malifoliella*.  
 “ “ 1b. Larva of *T. malifoliella*.  
 “ “ 1c. Ventral view of a portion of the anal segment of the larva, showing tentaculiform appendages.  
 “ “ 1d. Neuration of fore wing of *T. malifoliella*.
- “ Fig. 2. Adult *Bucculatrix pomifoliella* Clemens.  
 “ “ 2a. Apple twig with cocoons of *B. pomifoliella*.  
 “ “ 2b. A single cocoon much enlarged.  
 “ “ 2c. Neuration of fore wing of *B. pomifoliella*.  
 “ “ 2d and 2e. Ventral and lateral views of pupa of *B. pomifoliella*.



*A. B. Durom del*

Plate II.



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